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Final Report

August 1982

Quantification of Thoracic Response and Injury. The Gathering of Data. Appendix B: Rib Test Data

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16. Abstract

This report is Appendix B to the main report entitled "Quantification of Thoracic Response and Injury. The Gathering of Data." Included are force-deflection curves for rib samples taken from cadaver test subjects. These are supplemented by photographs of the cross-sections of the same samples. In addition to the main report and Appendix B, there is an Appendix A which contains complete impact test reports for the subjects. This package of reports presents methods and results for a series of 84 thorax impact tests using human cadaver subjects.

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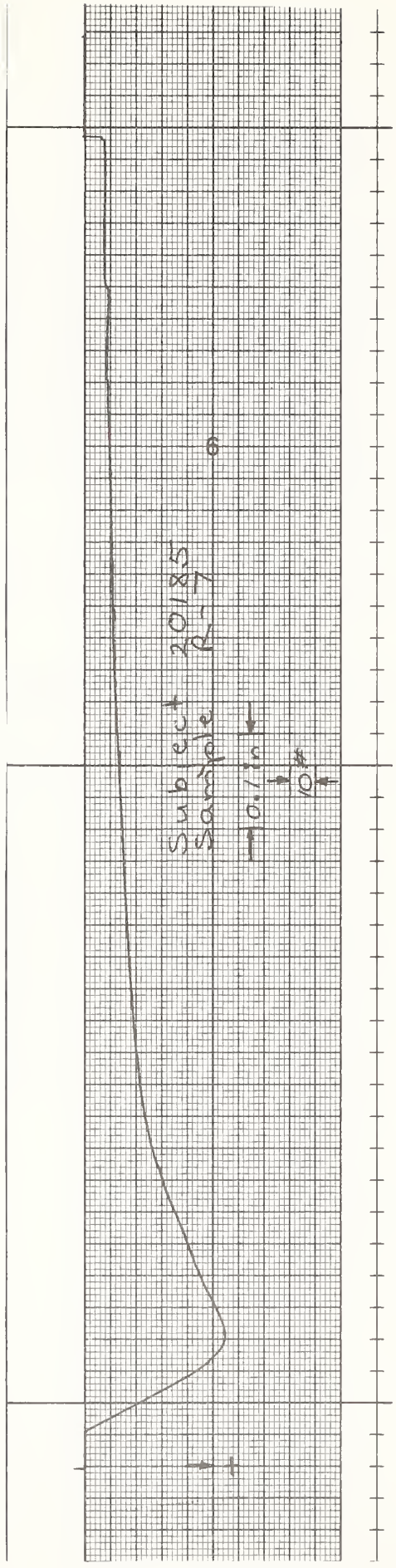
INTRODUCTION

This report is Appendix B to the main report entitled "Quantification of Thoracic Response and Injury. The Gathering of Data." Includedare force-deflection curves for rib samples taken from cadaver test subjects. These are supplemented by photographs of the cross-sections of the same samples. In addition to the main report and Appendix B, there is an Appendix A which contains complete impact test reports for the subjects. This package of reports presents methods and results for a series of 84 thorax impact tests using human cadaver subjects.

The rib samples which were tested are identified by a subject number. The following table lists the project test number for each subject.

TABLE 1. TEST NUMBER VERSUS SUBJECT NUMBER

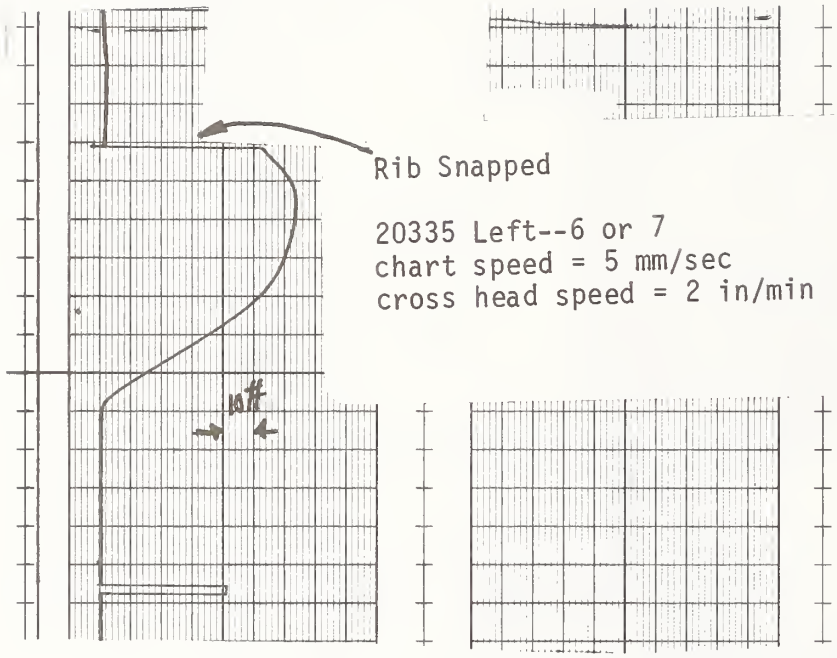
Test	Subject	Test	Subject	Test	Subject
A868	20185	76T025	20496	77T077	20777
A883	20219	76T029	20523	77T080	20788
A937	20335	76T039	20541	77T083	20800
76T003	20375	76T050	20597	77T086	20806
76T008	20414	76T053	20606	77T089	20818
76T009	20423	76T056	20616	77T092	20822
76T010	20441	76T059	20615	77T095	20837
76T011	20445	76T062	20621	77T098	20853
76T020	20476	76T065	20629		
76T021	20487	77T068	20761		
76T022	20489	77T071	20765		
76T024	20494	77T074	20774		


6
0.1
10

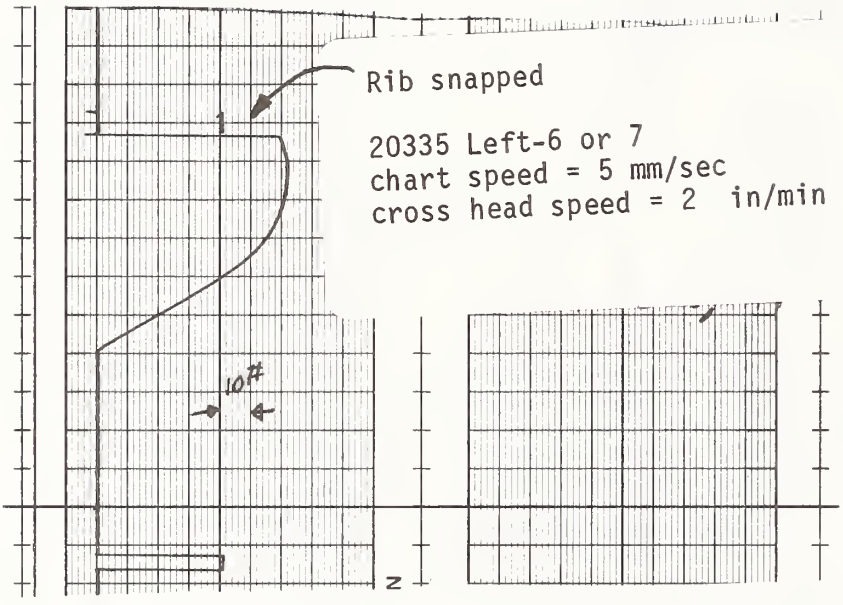
20185 R7

20219 R-7 Rt.
4" Span
CLEVITE CORPORATION / BRUSH INSTRUMENTS DIVISION
CLEVELAND, OHIO. PRINTED IN U.S.A.

2021G R7
50ths


Rib Snapped
20335 Left--6 or 7
chart speed = 5 mm/sec
cross head speed = 2 in/min
10#

20335 L6
5071


Rib snapped
20335 Left-6 or 7
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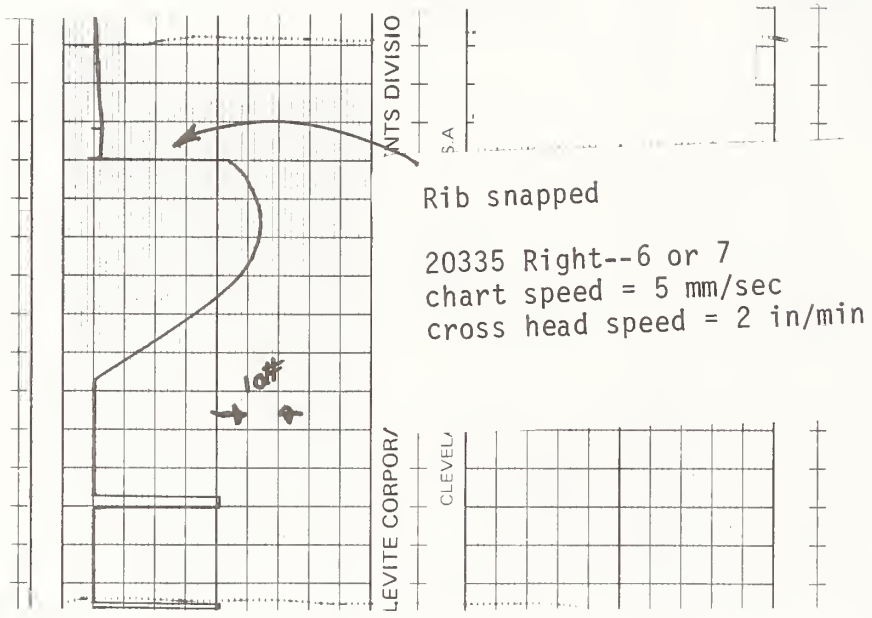
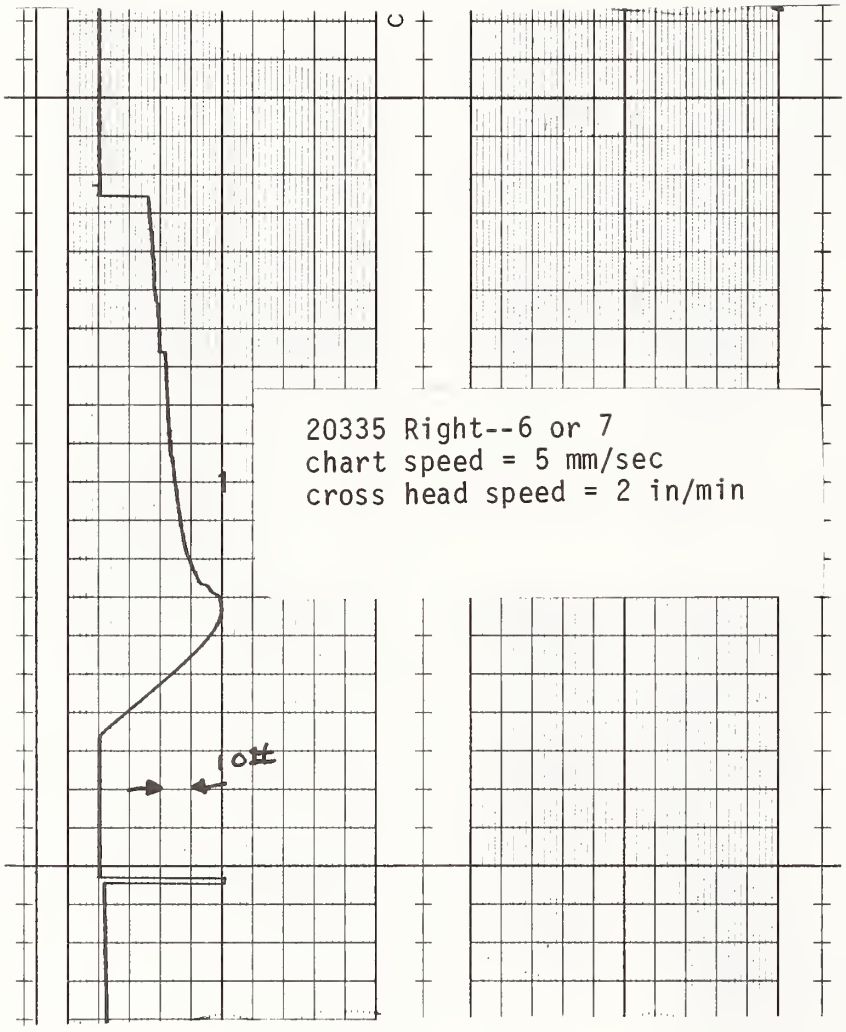
cross head speed = 2 in/min
10#
z

2033 L7
50ths

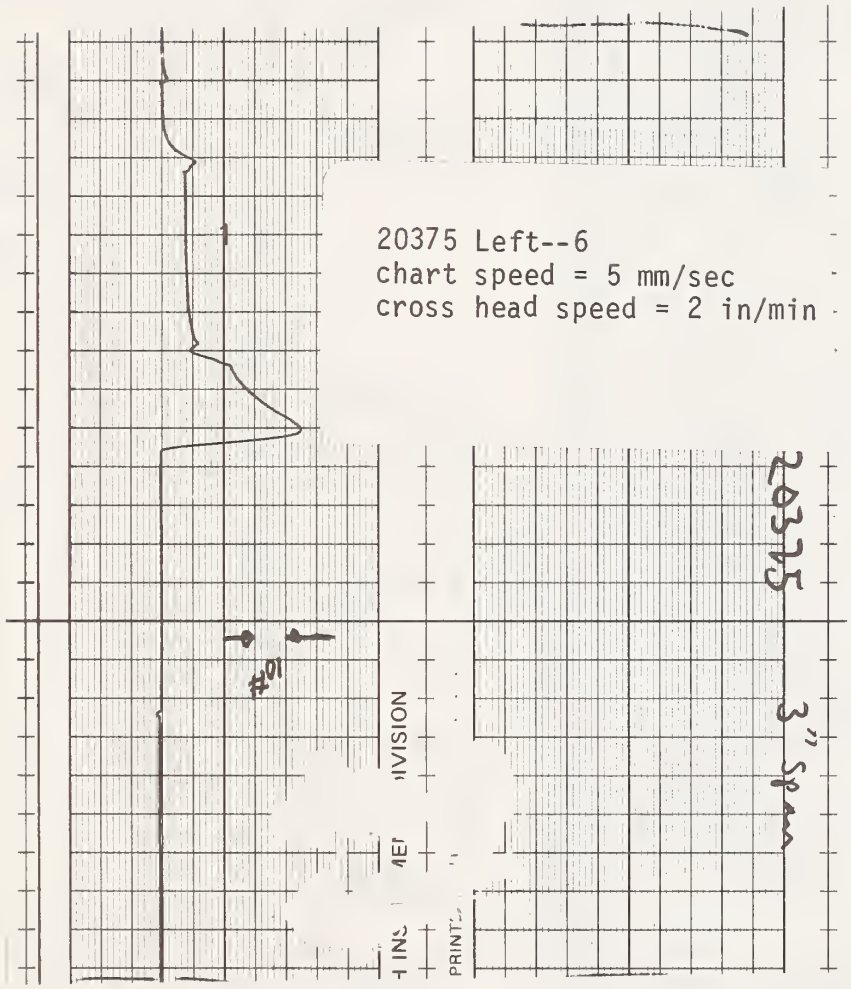

Rib snapped
20335 Right--6 or 7
chart speed = 5 mm/sec
cross head speed = 2 in/min

2033: R6
50th

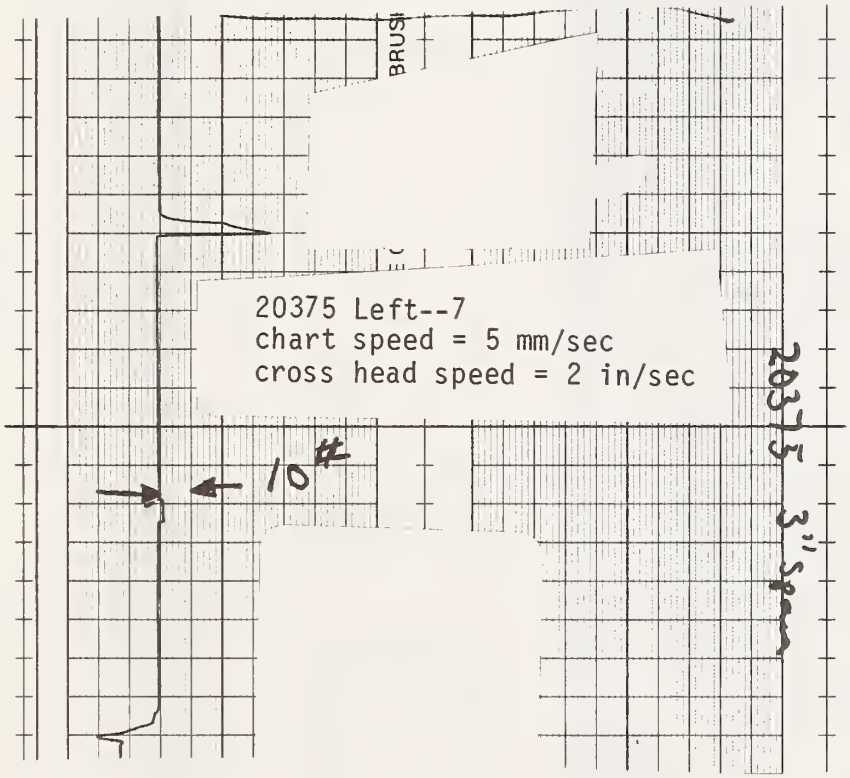

20335 Right--6 or 7
chart speed = 5 mm/sec
cross head speed = 2 in/min
1
10#

2035 R7

2033 R7
50th


20375 Left--6
chart speed = 5 mm/sec
cross head speed = 2 in/min
20375
3" Span

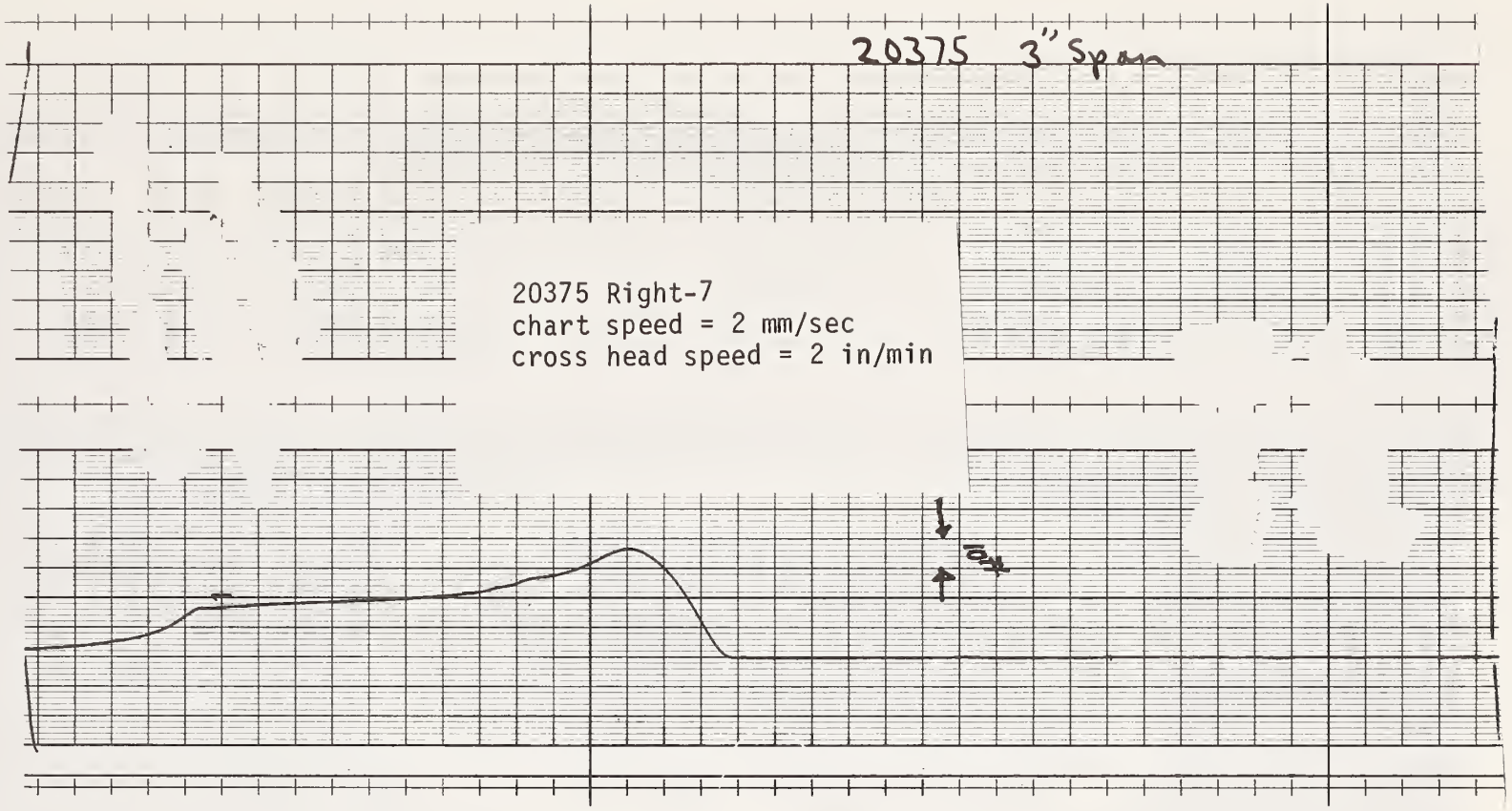
20375 L6
50th


20375 Left--7
chart speed = 5 mm/sec
cross head speed = 2 in/sec
10#
20375
3" span

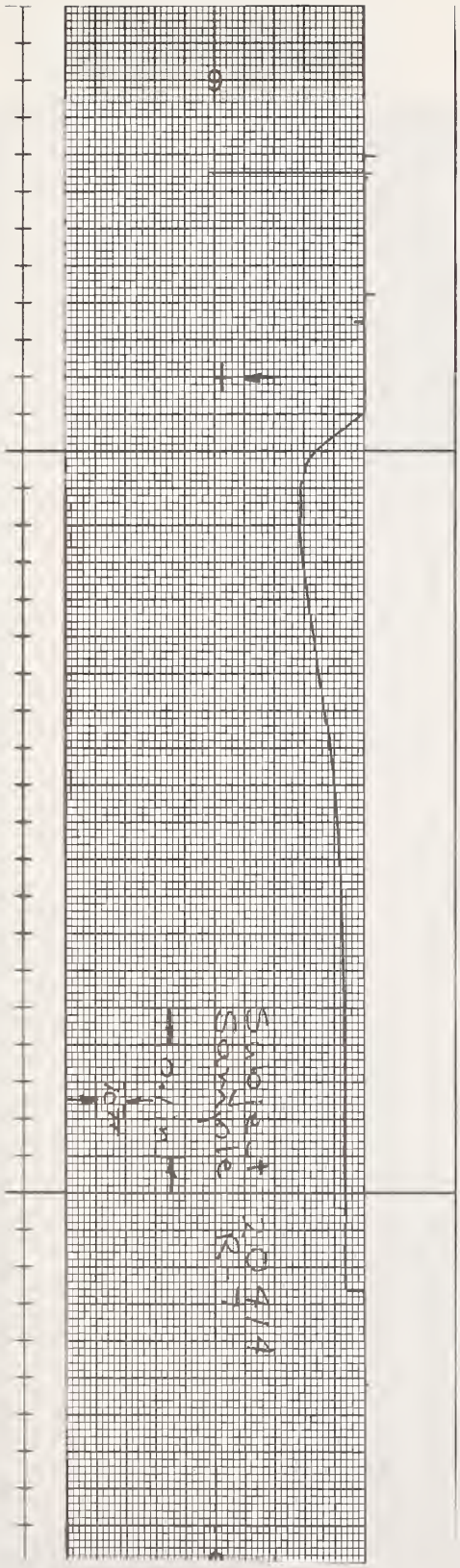
20375 L7
South

20375 R-6 Rt 3" Span
x-head 2 ipm
chart 5 mm/sec
1.0 #
CLEVITE CORPORATION/BRUSH INSTRUME
CLEVELAND, OHIO. PRINTED IN U

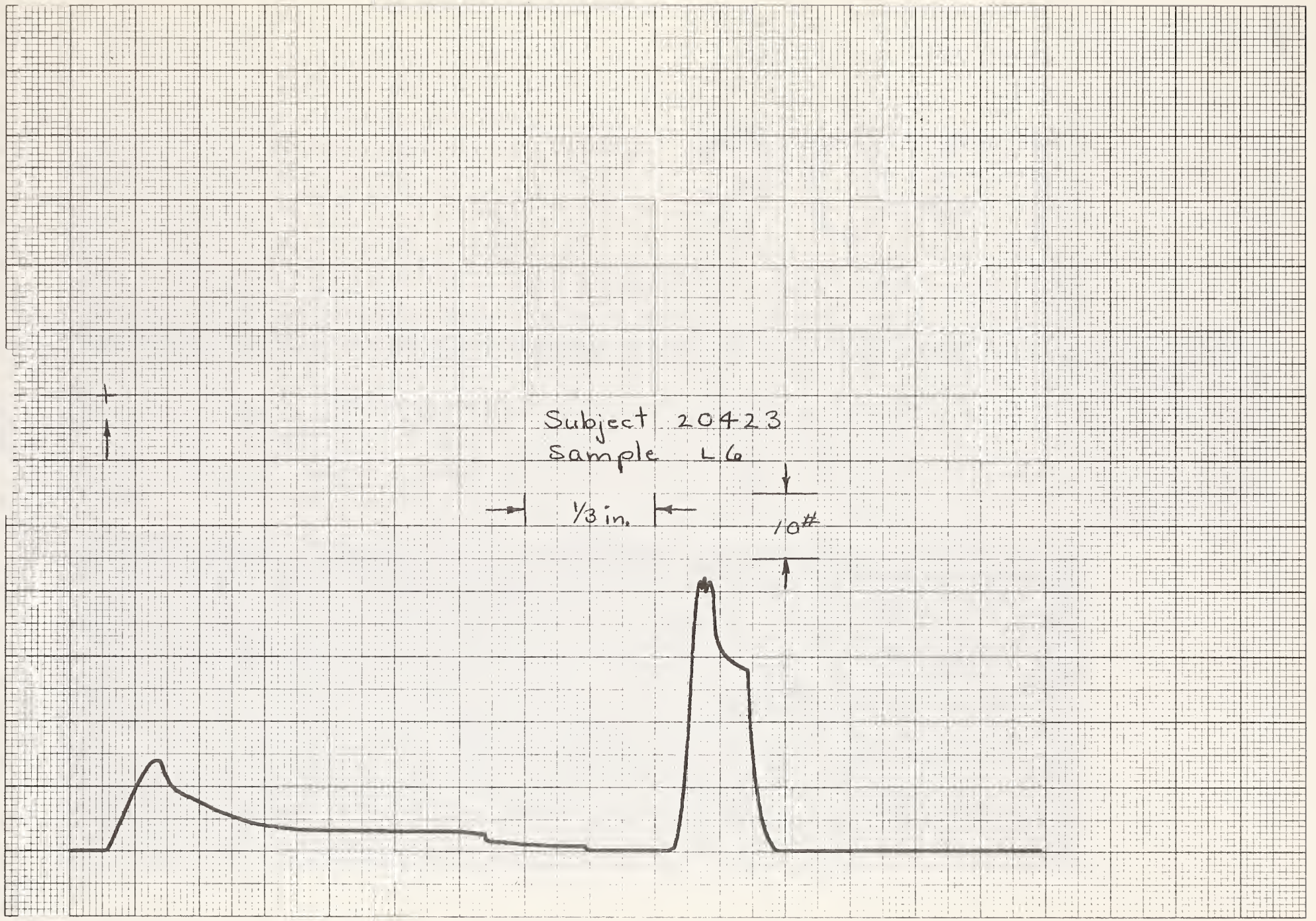
20375 R6
50th


20375 3" Span
20375 Right-7
chart speed = 2 mm/sec
cross head speed = 2 in/min
10 lbs

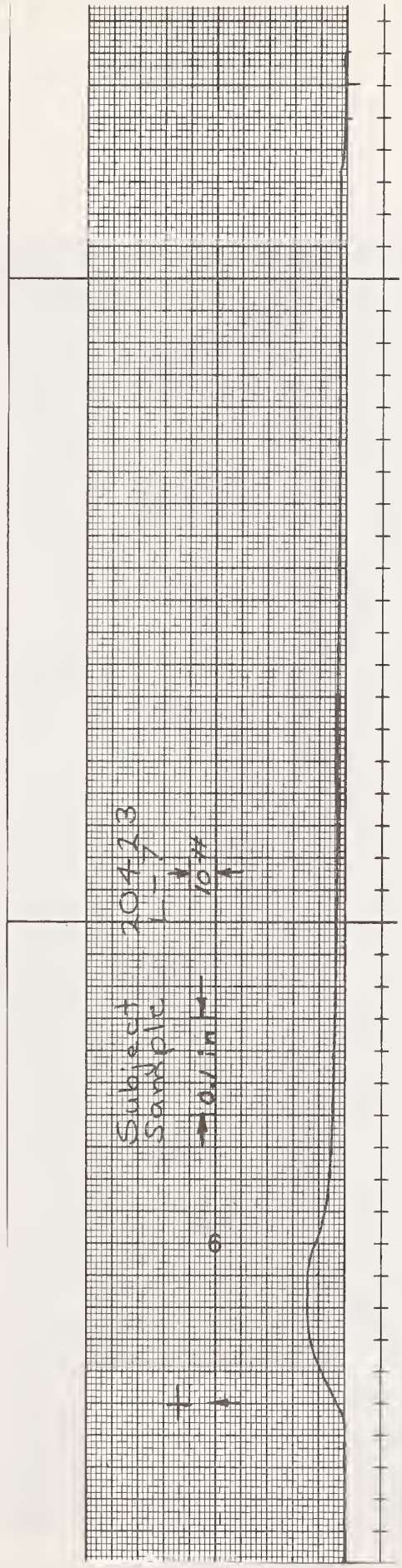
20375 R7
50+1



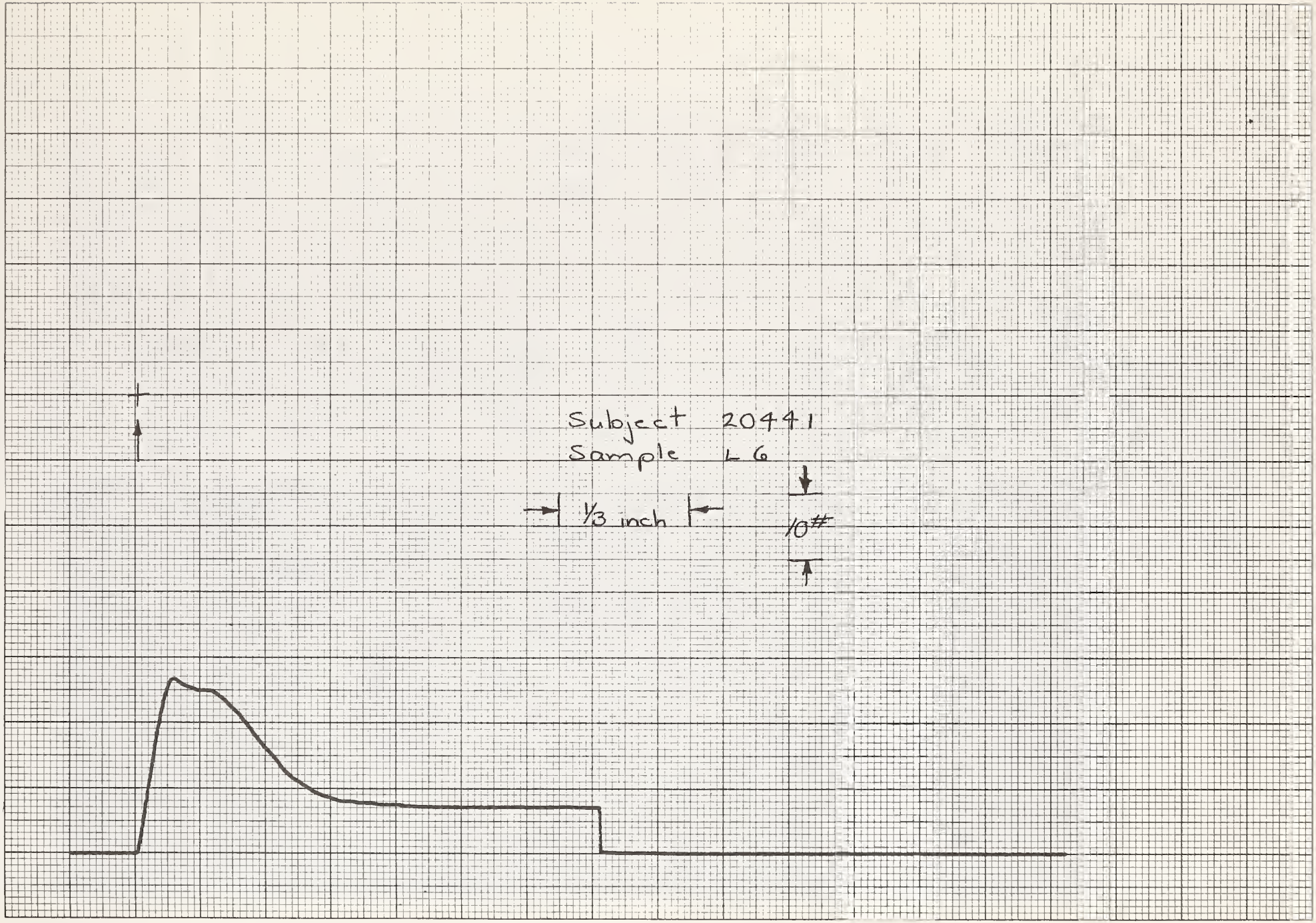
20414 R7


Subject 20423
Sample L6
1/3 in.
10#

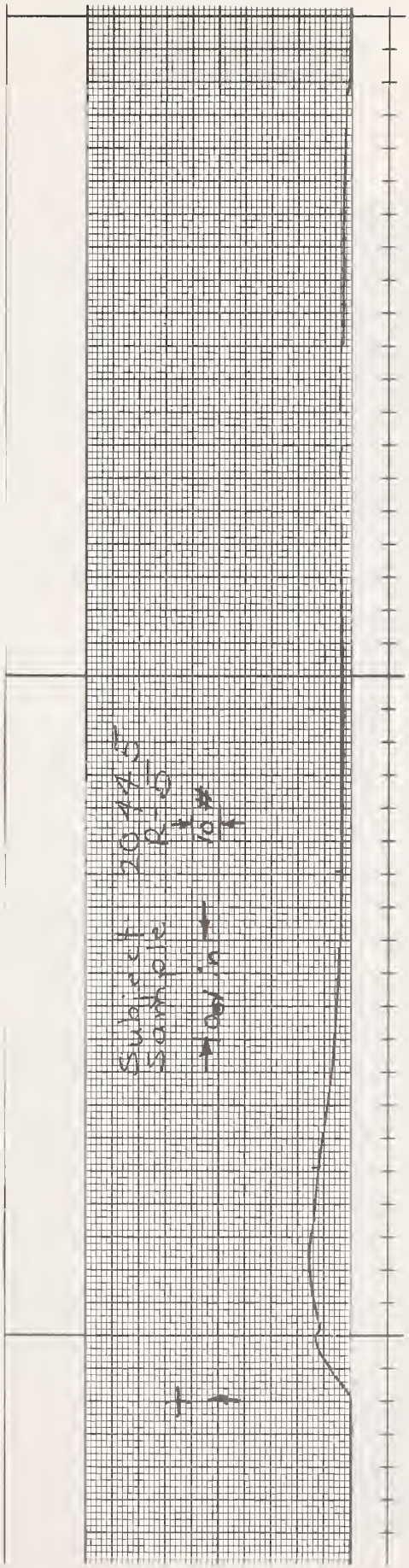
2042316
5 0 t h


Shielded
Strain Gage
1/16 in.
6
10#
10#

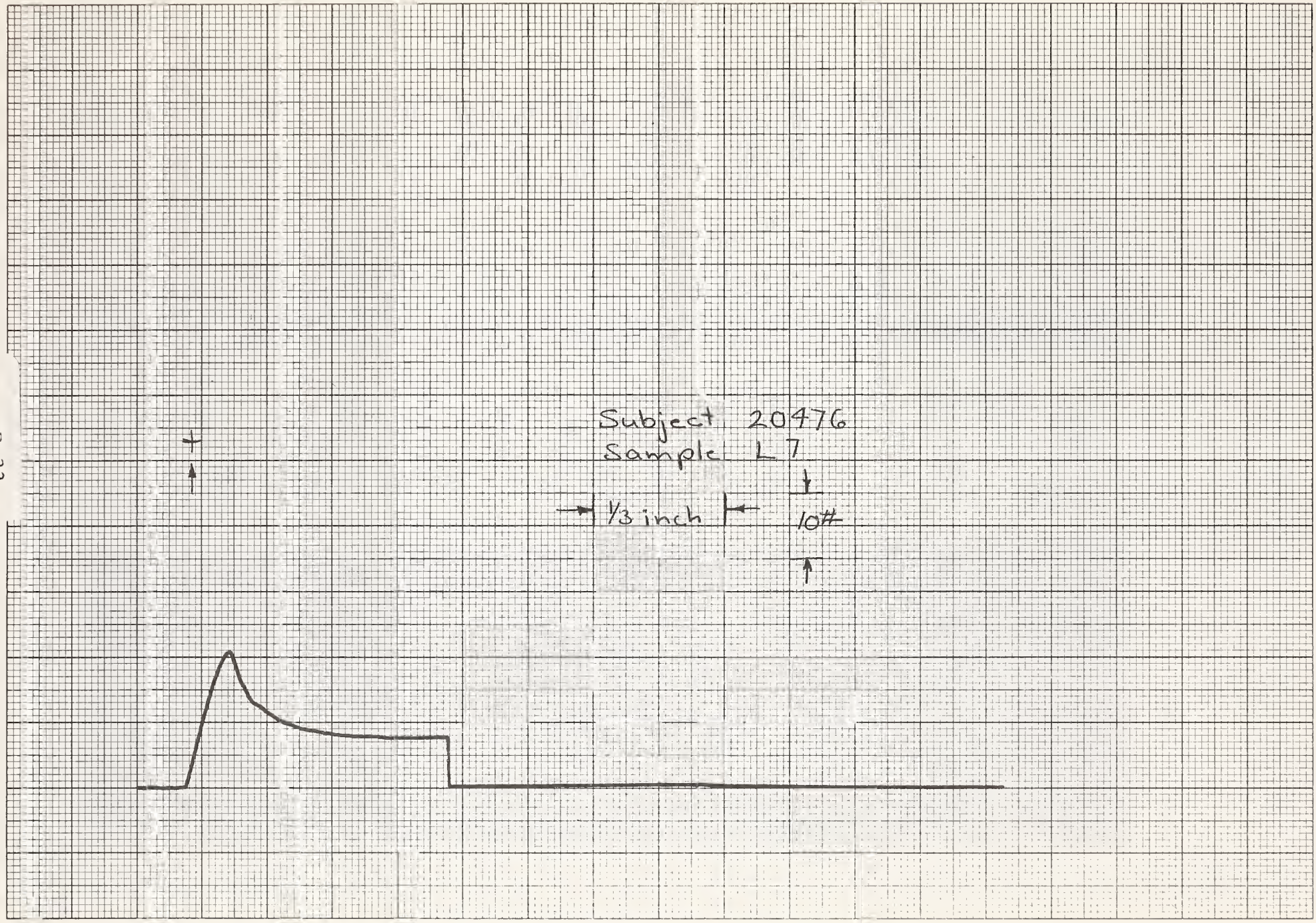
20423 L7
INCHES
1


Subject 20441
Sample L 6
1/3 inch
10#

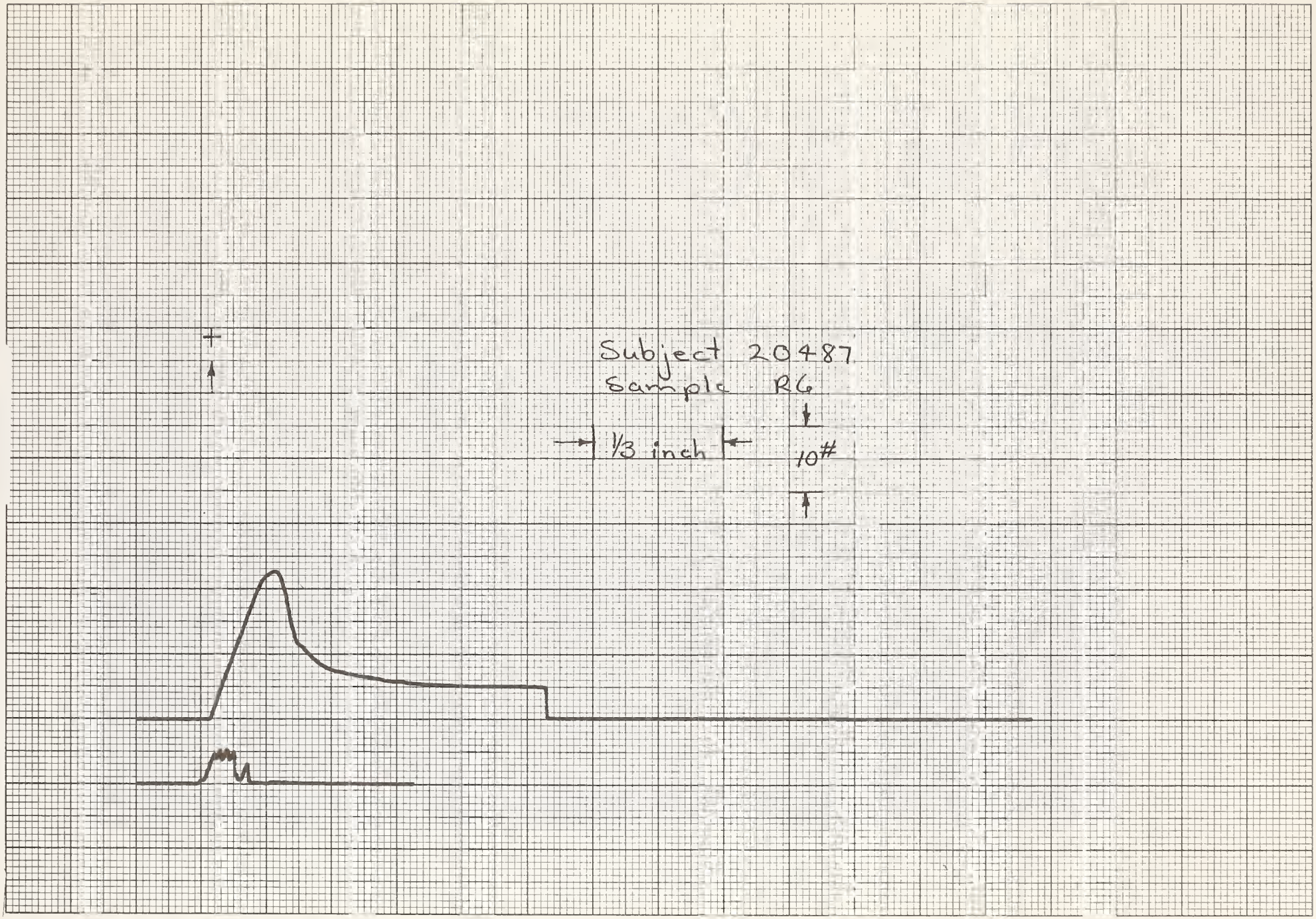
20441 R6
5 0 + h s



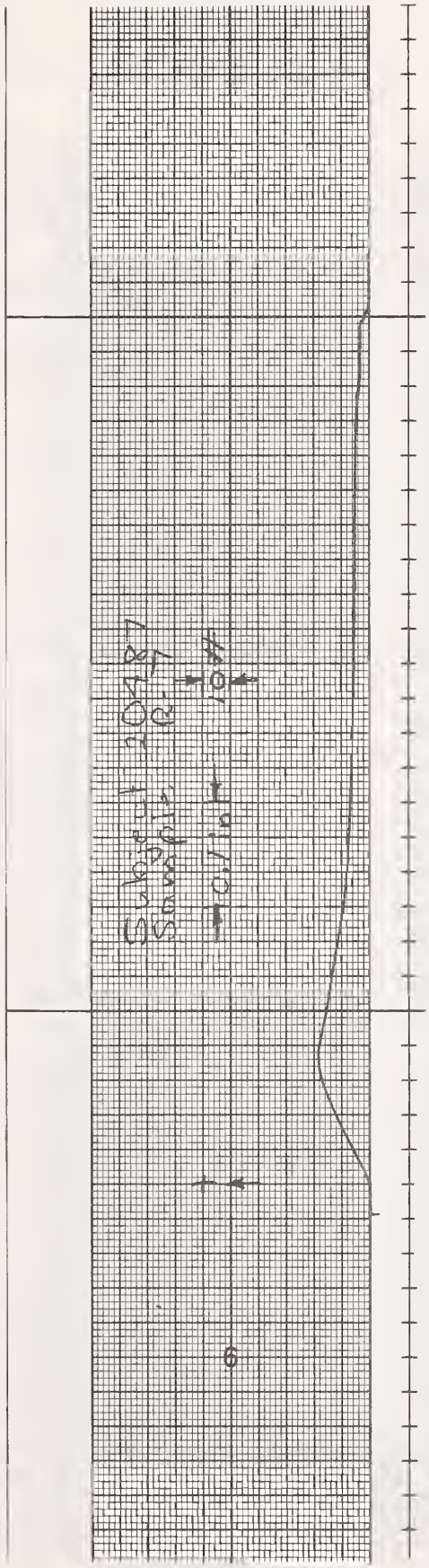
2045 R5

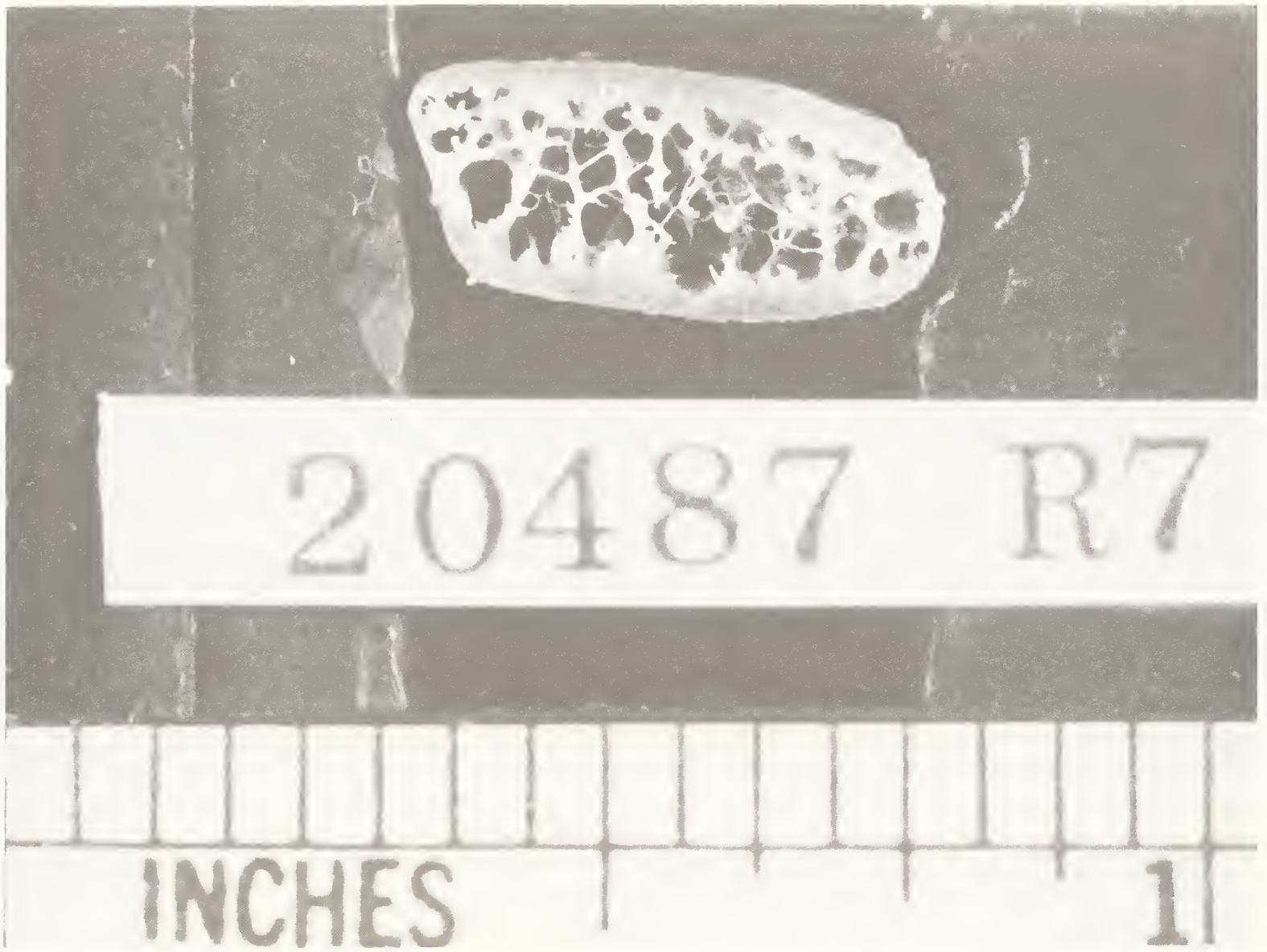

Subject 20476
Sample L 7
1/3 inch
10#

7T020 L7
50ths


Subject 20487
Sample R6
1/3 inch
10#

20487 R6
50ths


6


20487 R7
INCHES
1

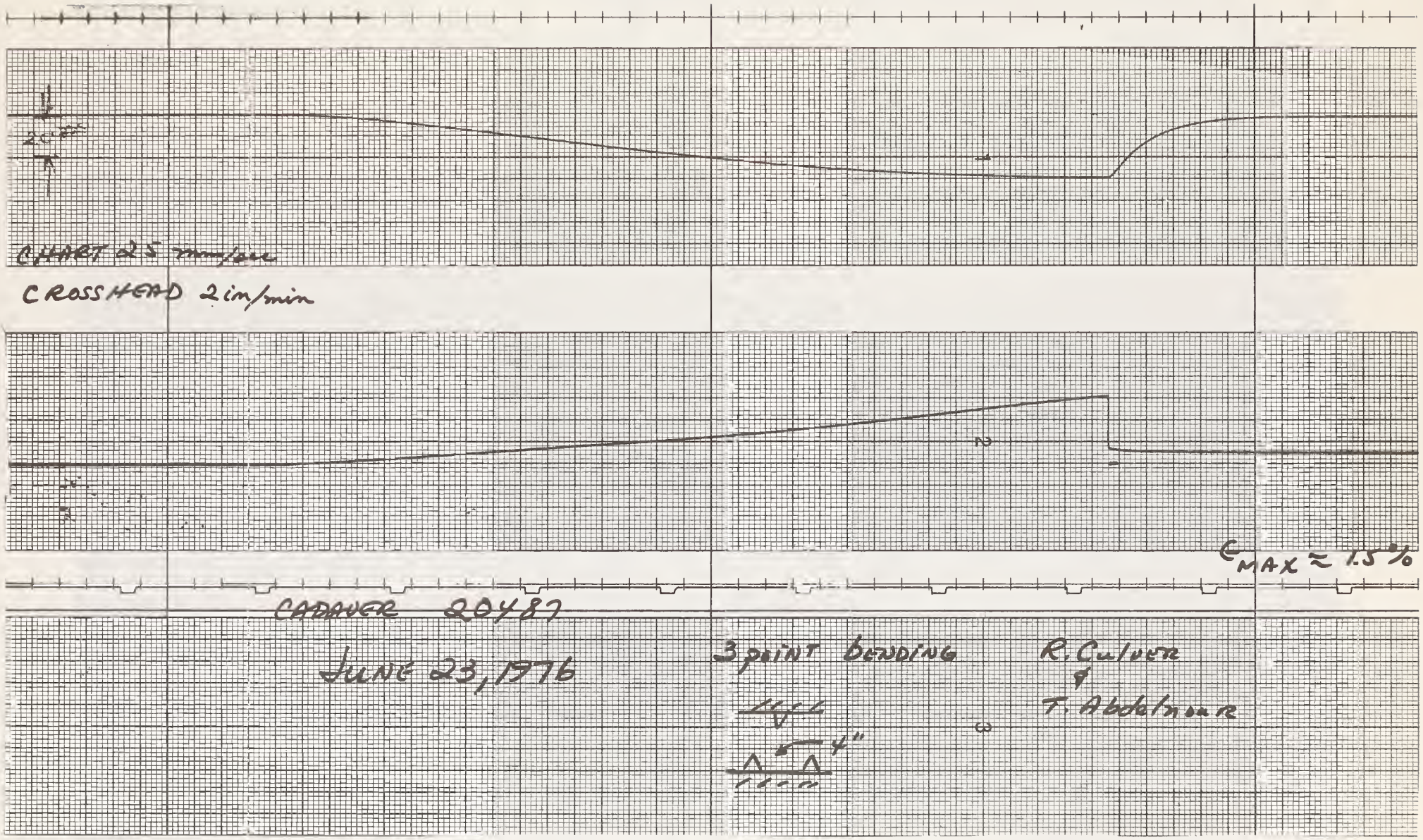
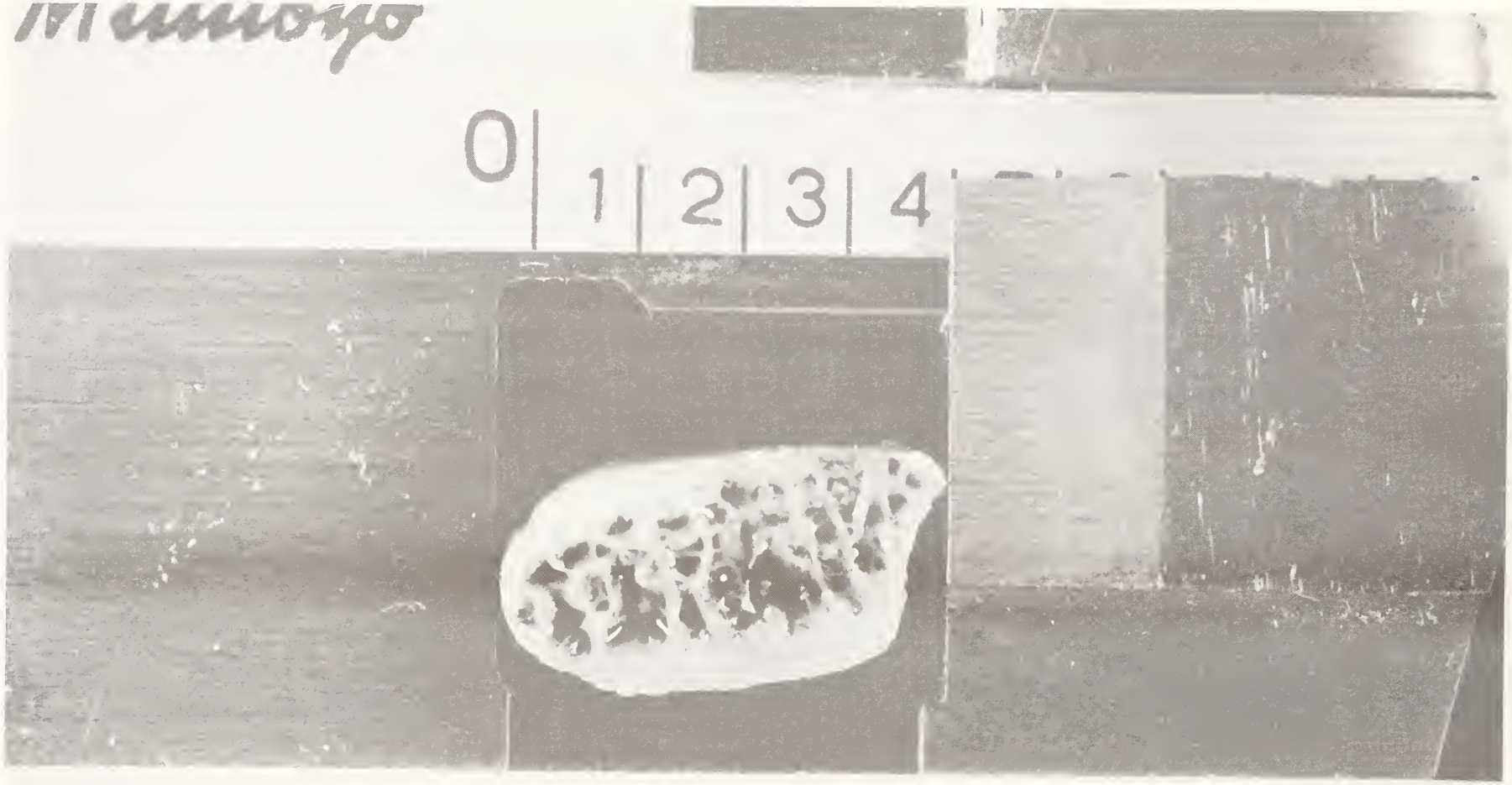
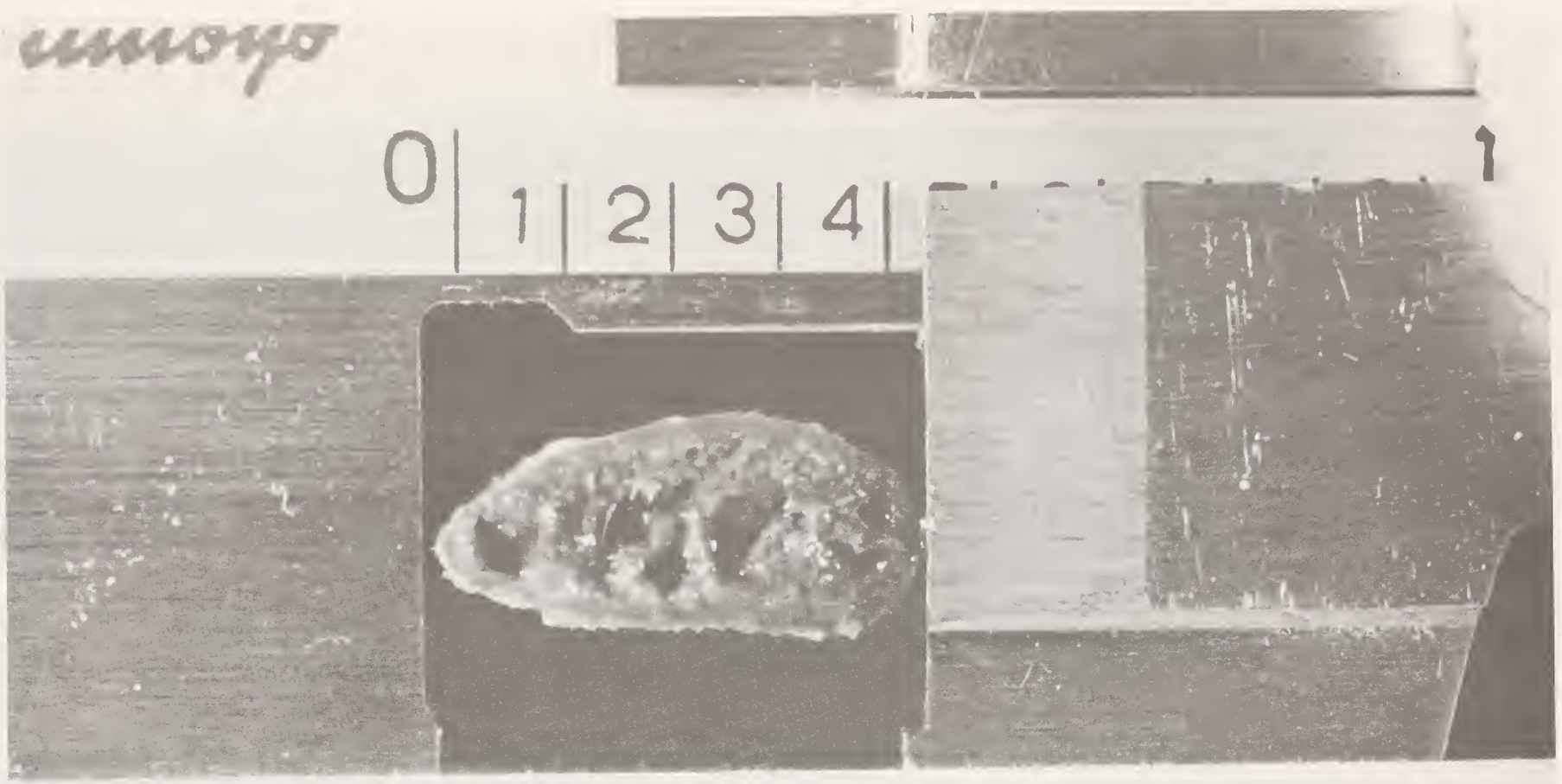


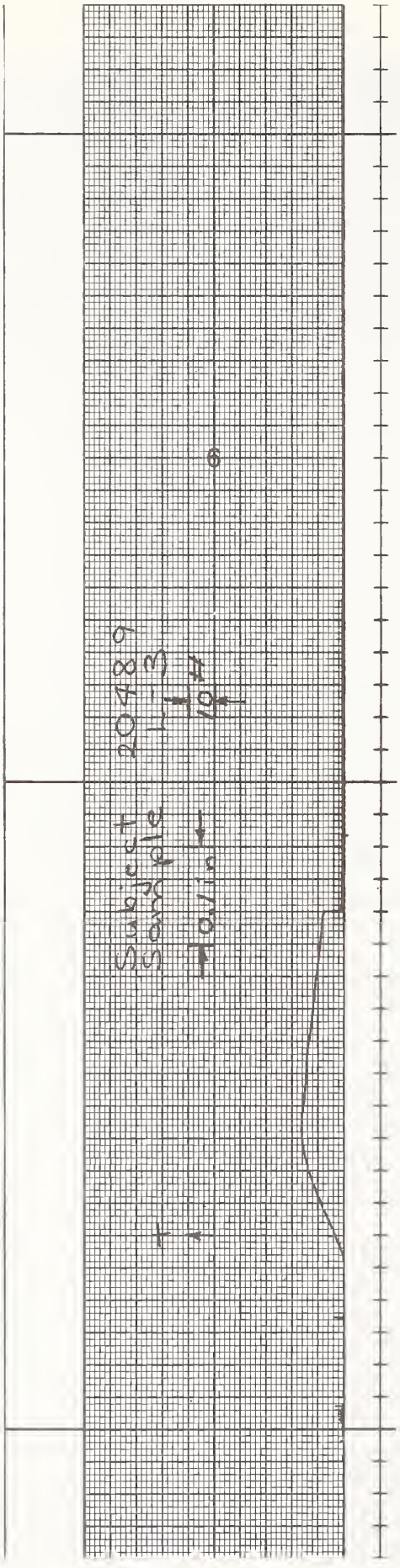
CHART 25 mm/sec
CROSSHEAD 2 in/min
$\epsilon_{MAX} \approx 1.5\%$
CADAVER 20487
JUNE 23, 1976
3 POINT BENDING
4"
R. Culver
&
T. Abdelmoumen



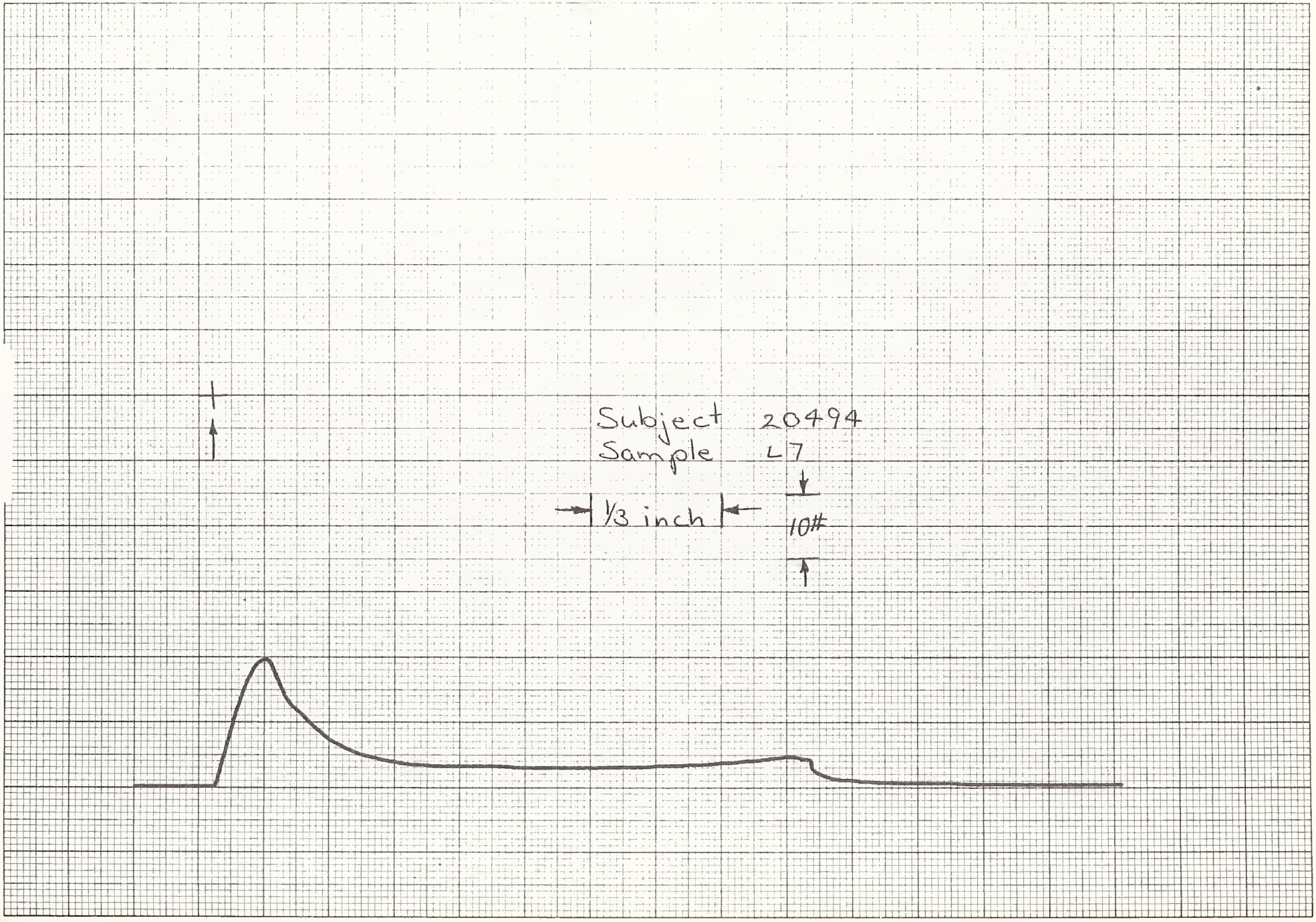
20487
Bending Lt R7



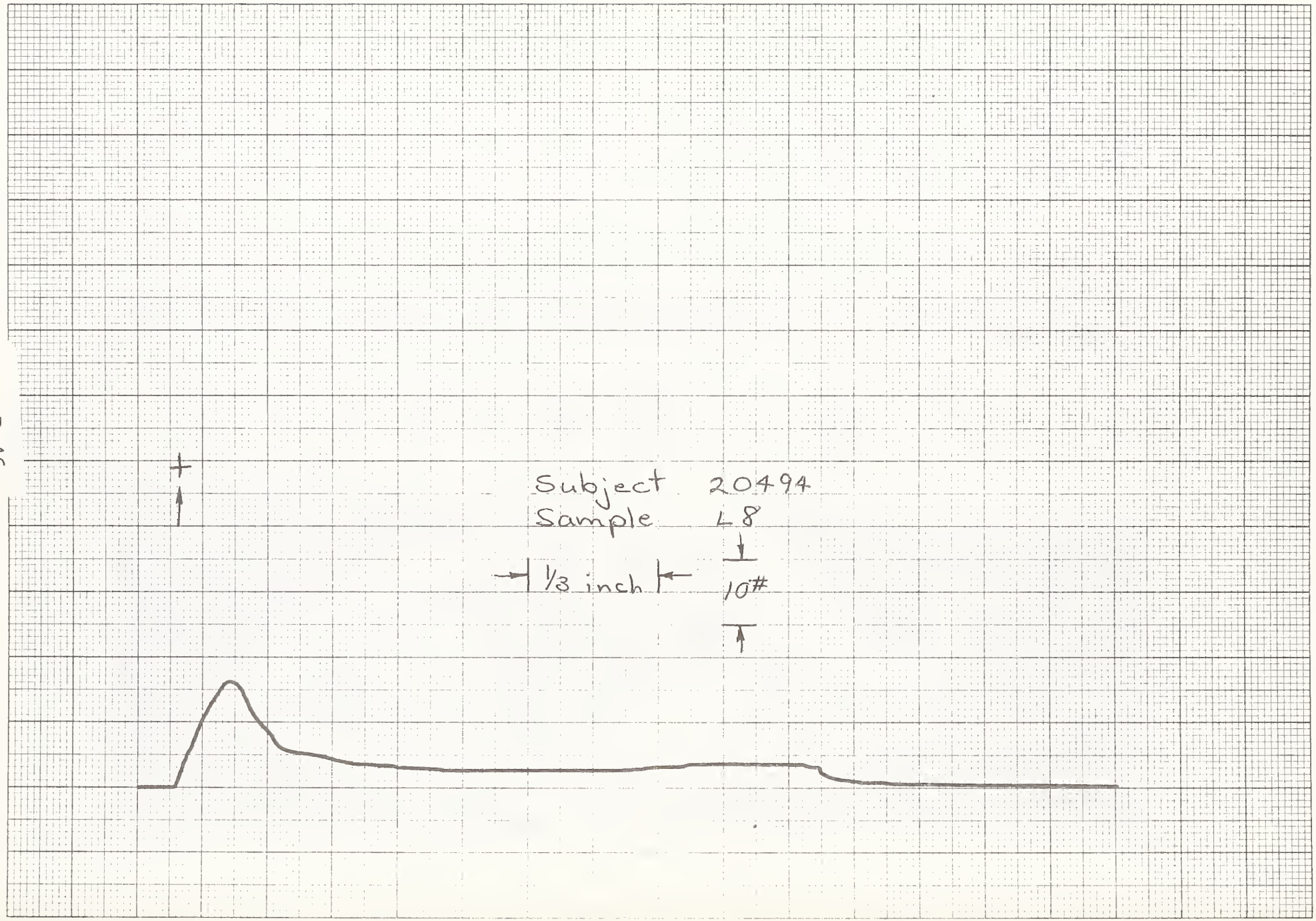
20487
Torsion Lt R8


6
2048
2-14-83
19
Surface
Bottom

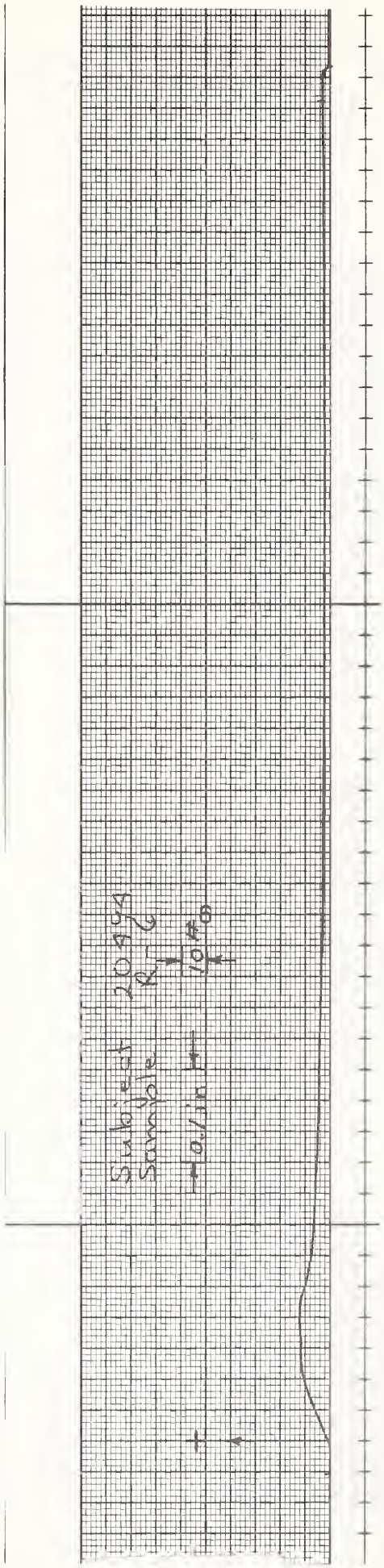
20489 L3
INCHES
1


Subject 20494
Sample L7
1/3 inch
10#

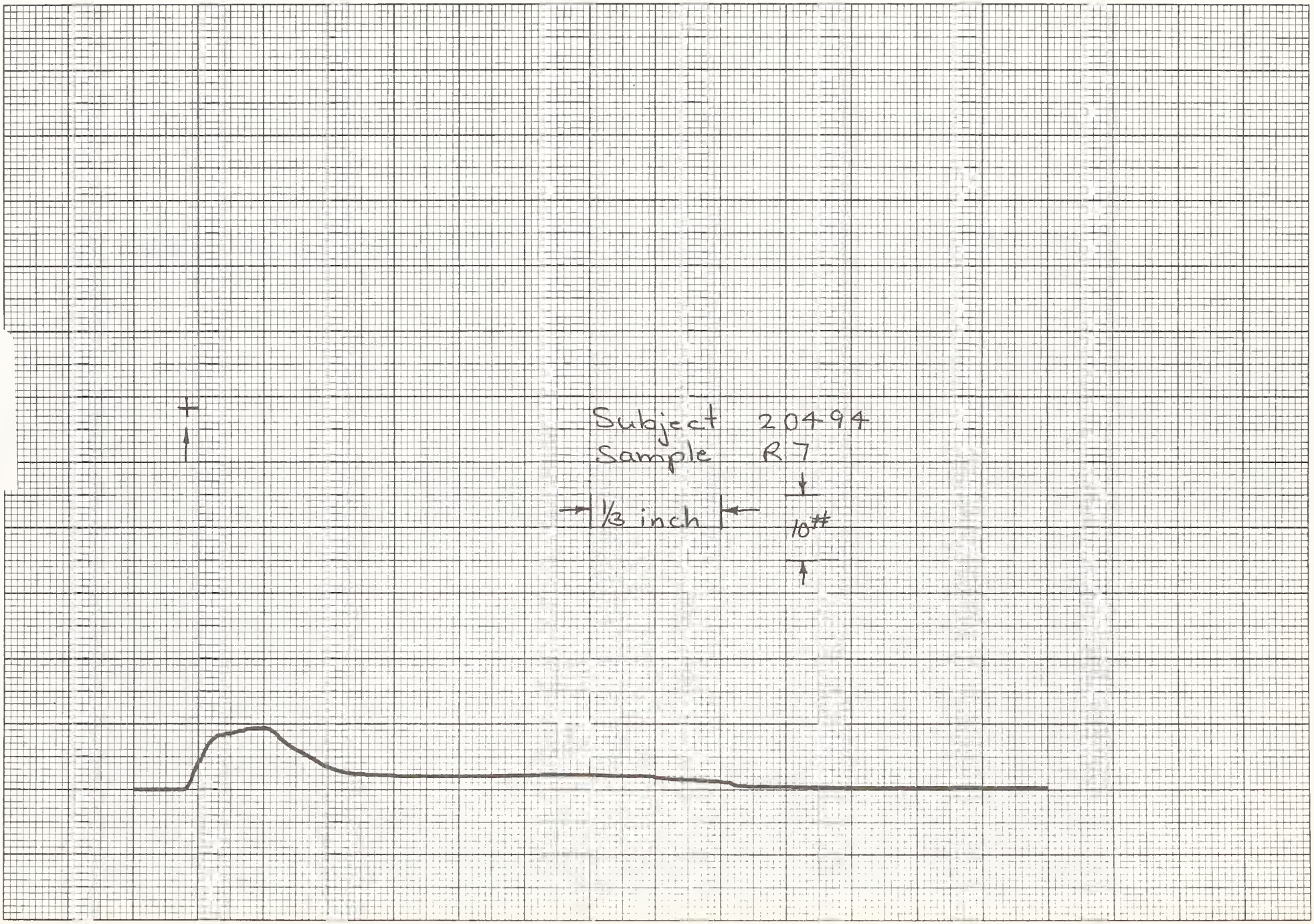
2024 T4
50ths


Subject 20494
Sample L8
1/3 inch
10#

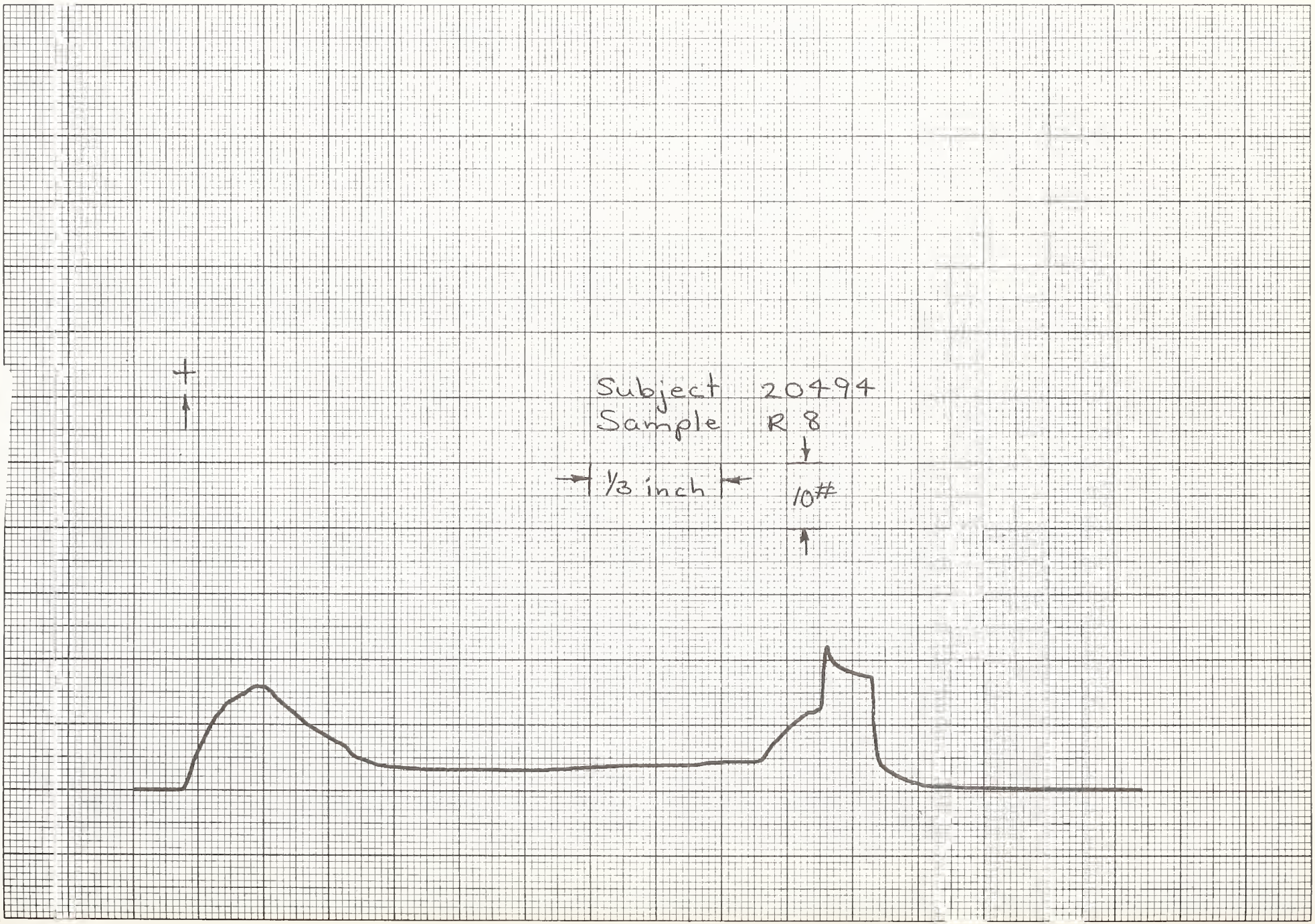
2049 L8
5 0 t h s


Subject test
Sample
2.0 kg
2 in
10 sec
0.1 in

20494 R6


Subject 20494
Sample R7
1/3 inch
10#

20494 R7
507

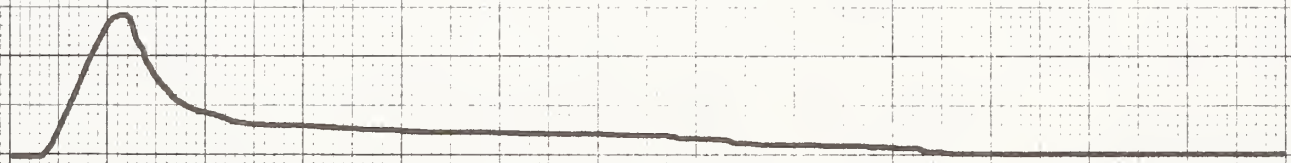

Subject 20494
Sample R 8
1/3 inch
10#

20494 R8
50ths

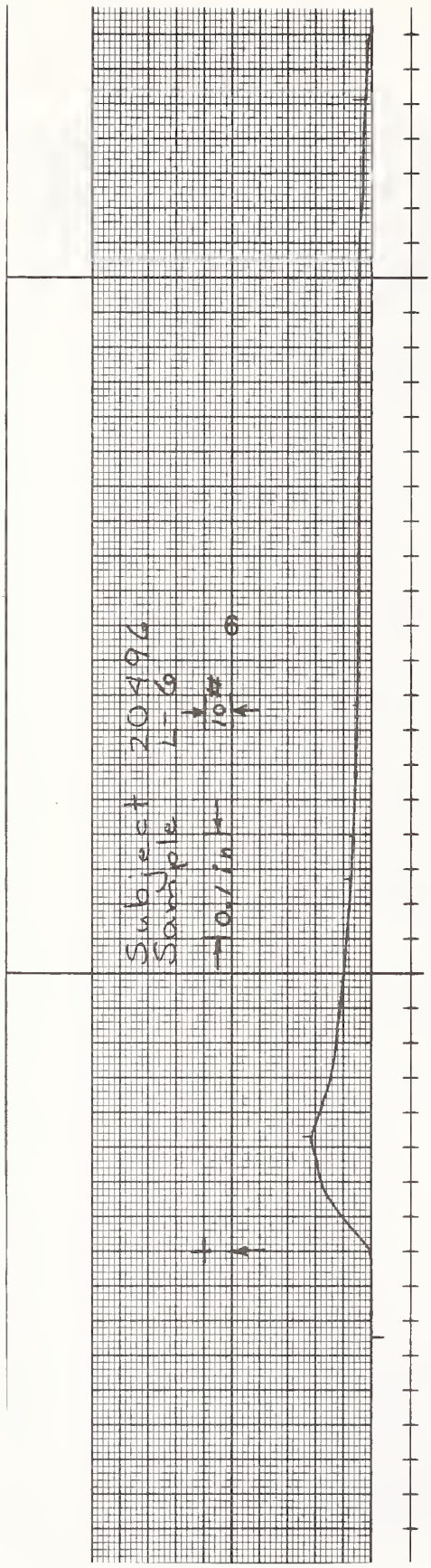
Subject 20494
Sample R9

1/3 inch

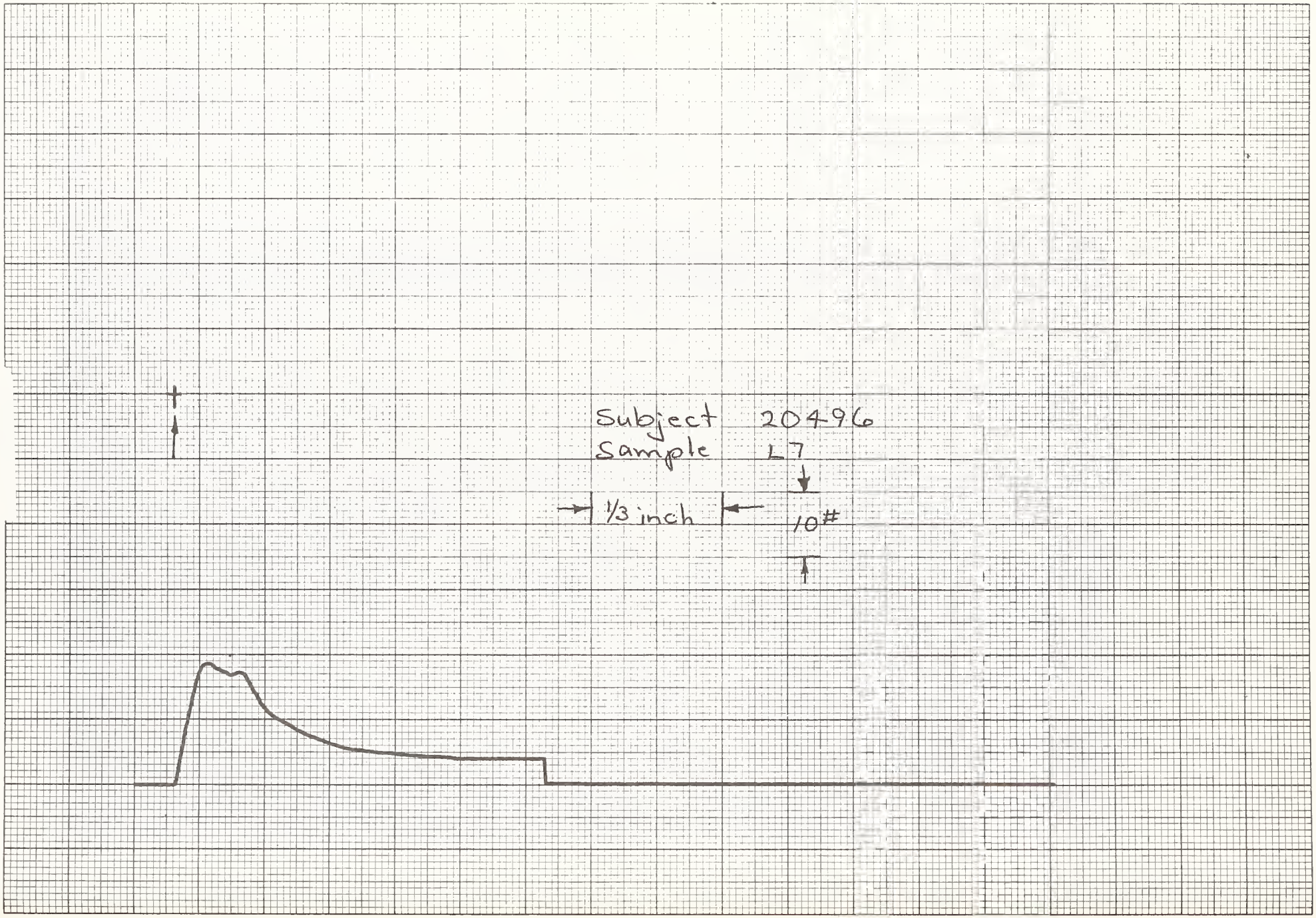
10#



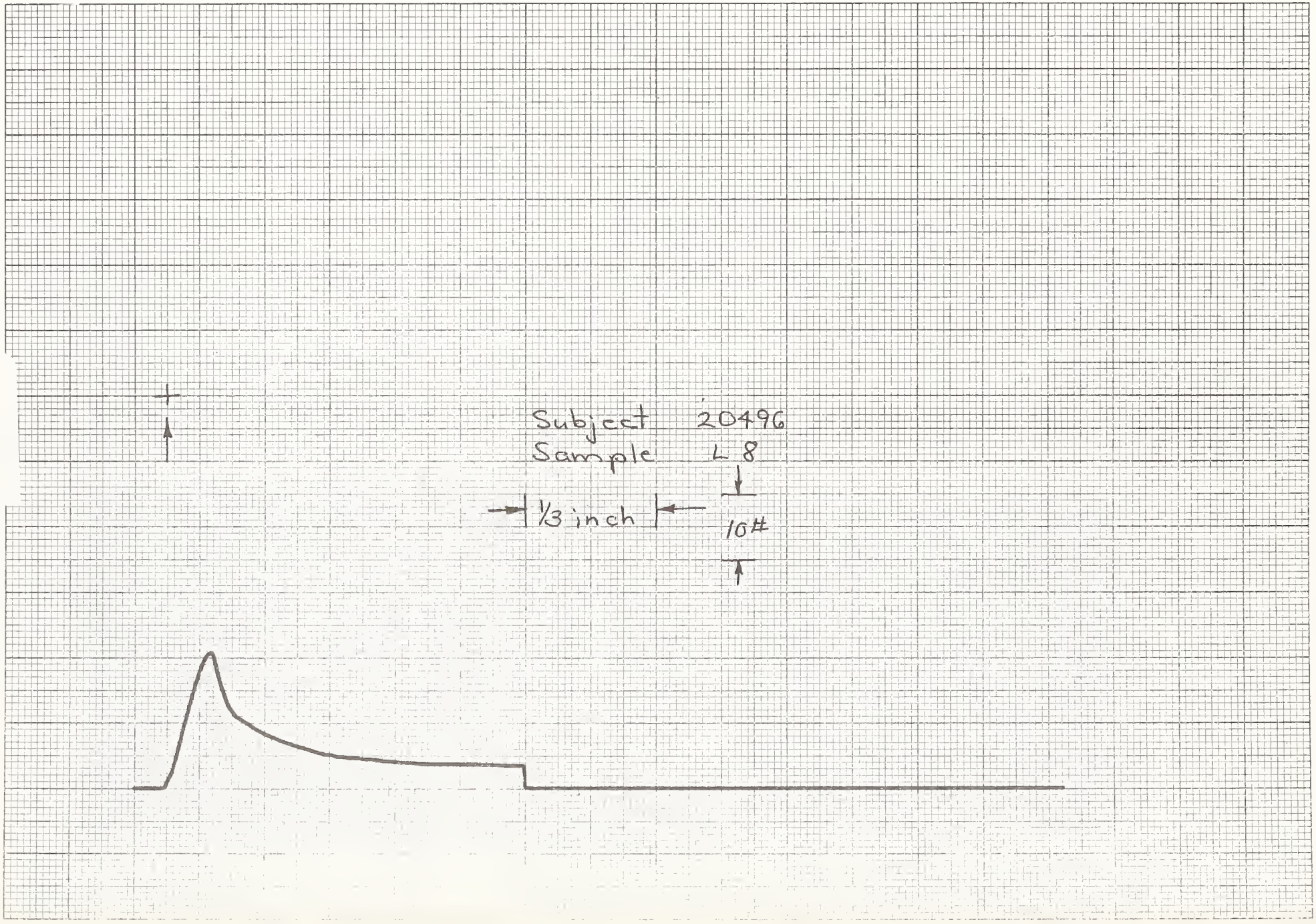
20494 R9
50ths



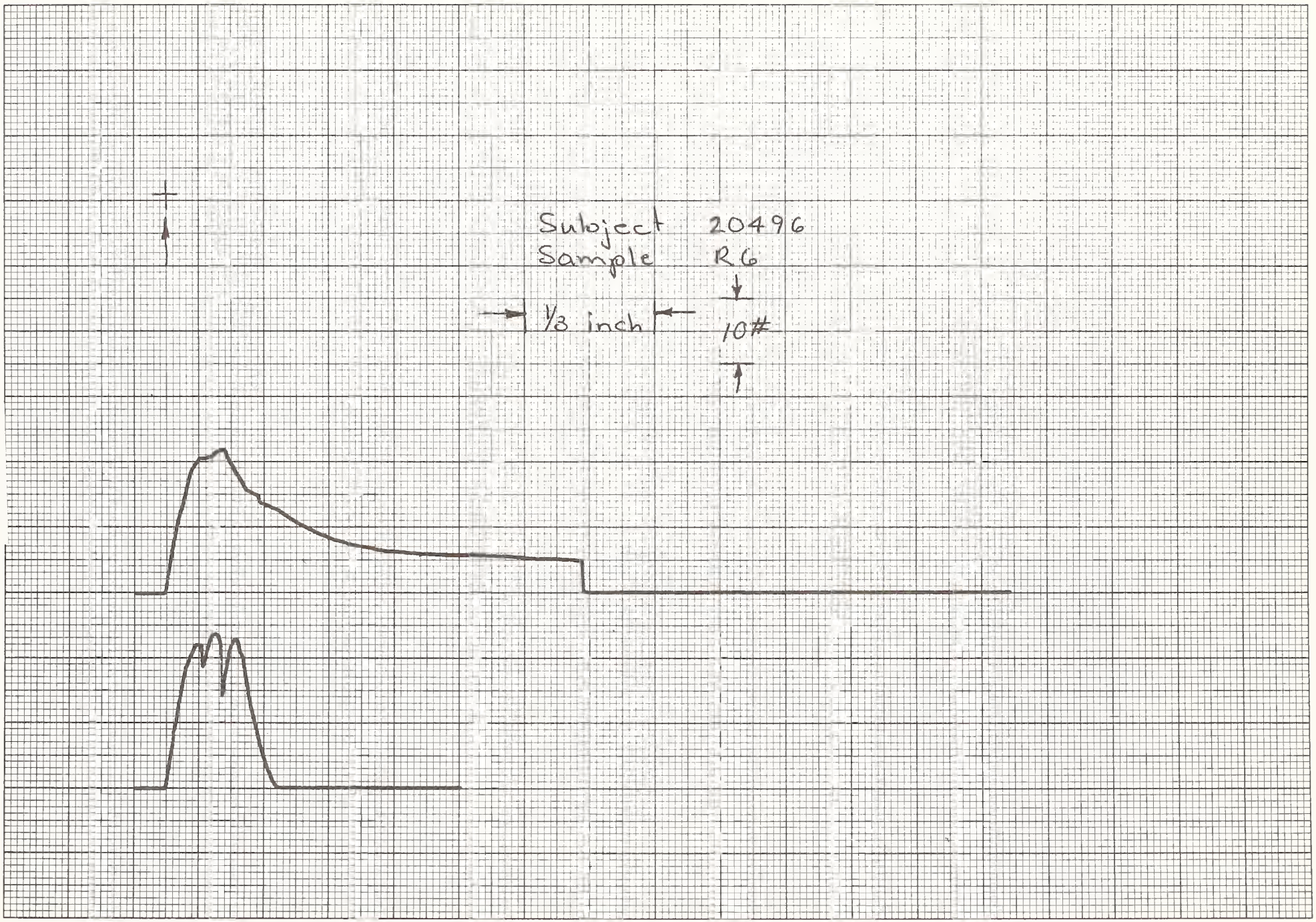
20496 L6
INCHES
1


Subject 20496
Sample L7
⅓ inch
10#

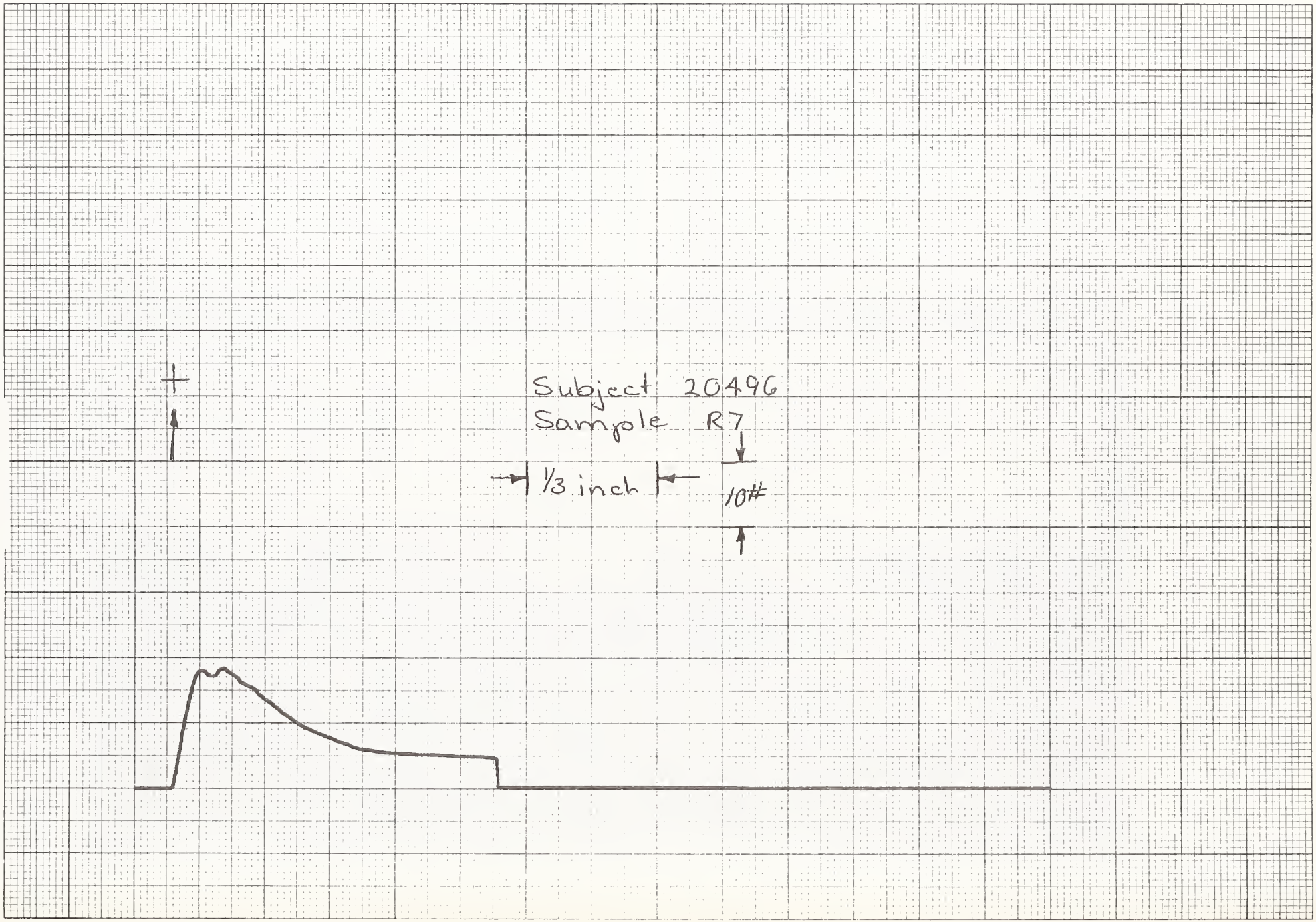
20496 L7
50ths


Subject 20496
Sample L 8
1/3 inch
10#

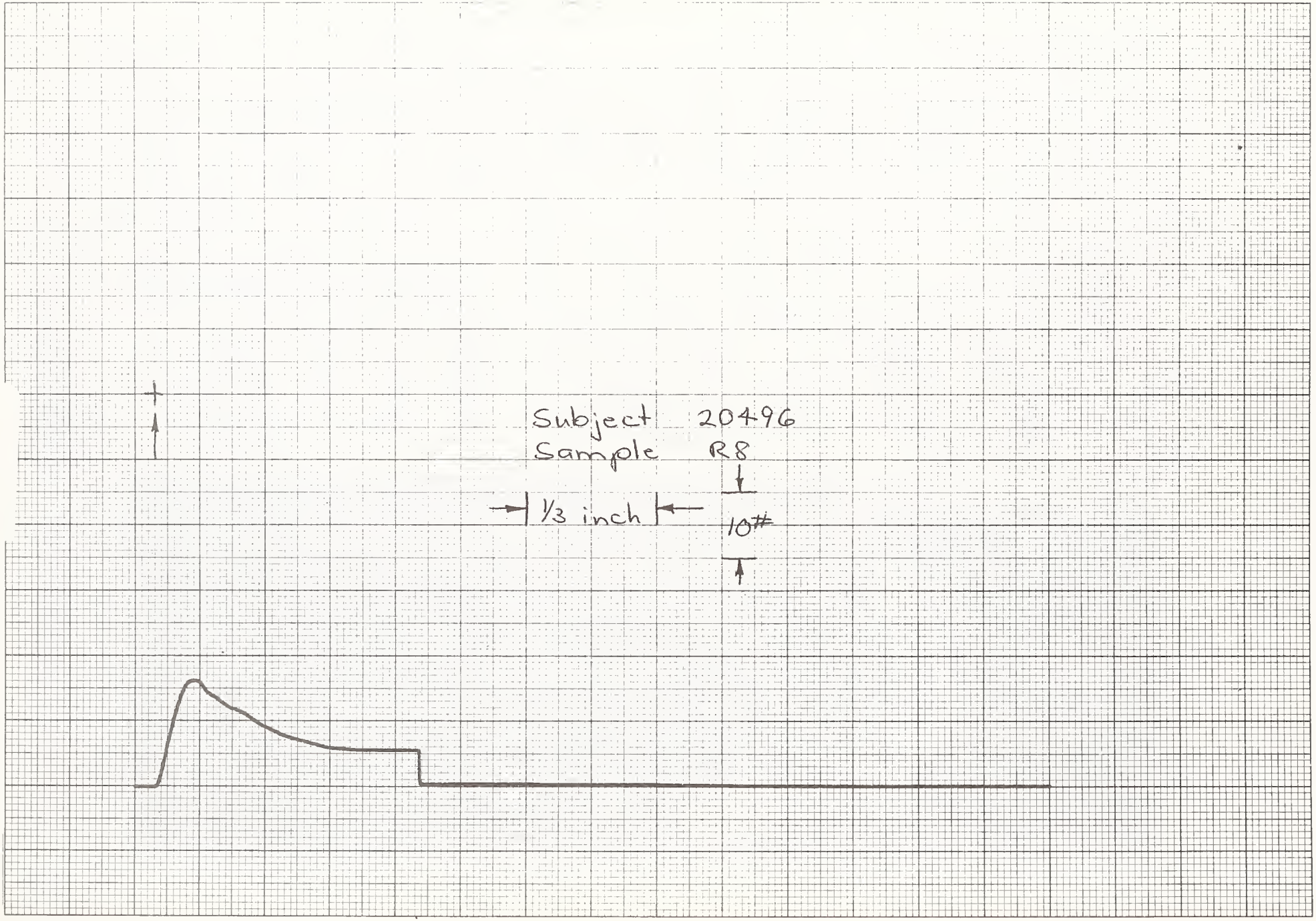
20496 L8
50thS


Subject 20496
Sample R6
1/8 inch
10#

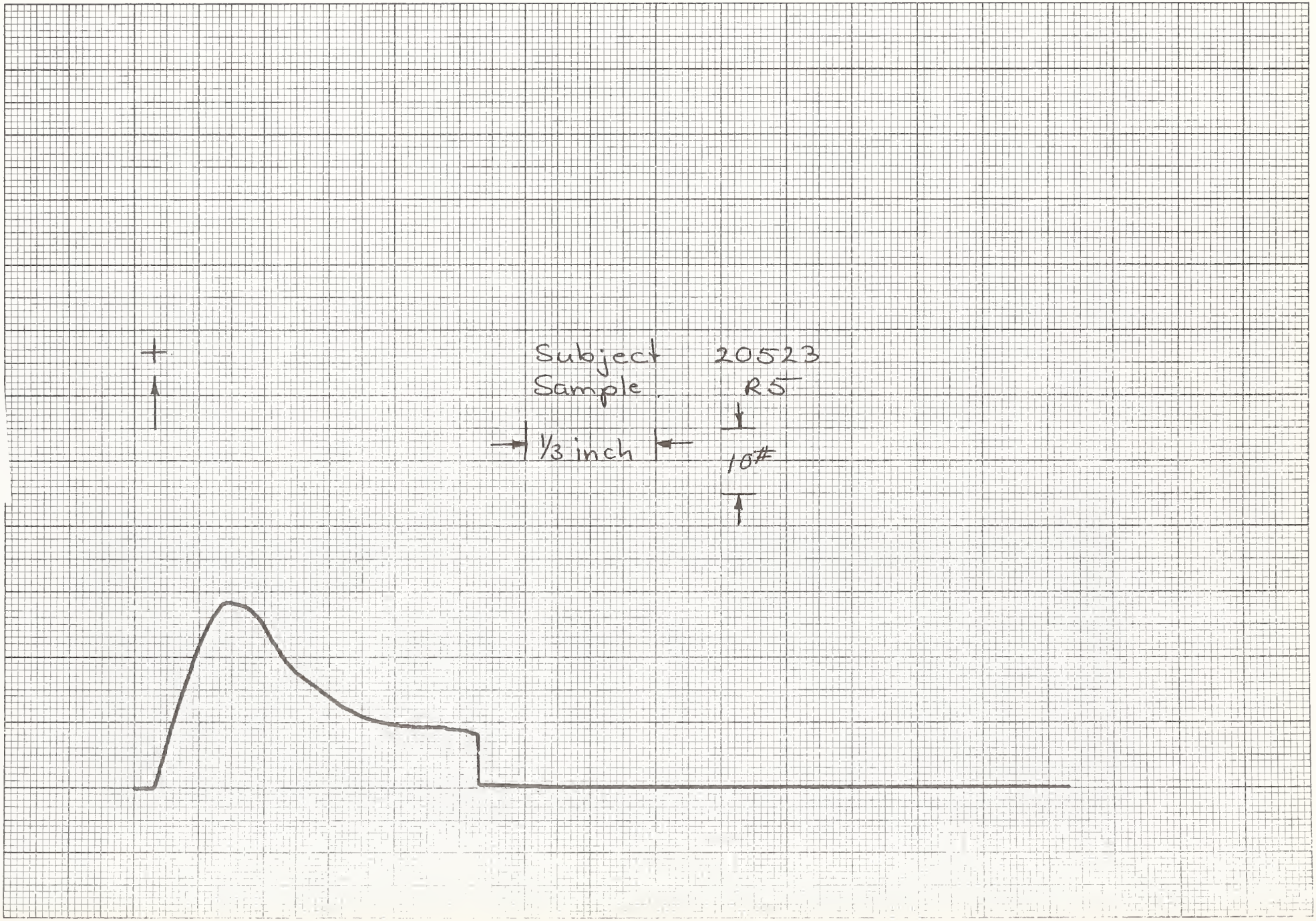
20496 R6
50ths


Subject 20496
Sample R7
1/3 inch
10#

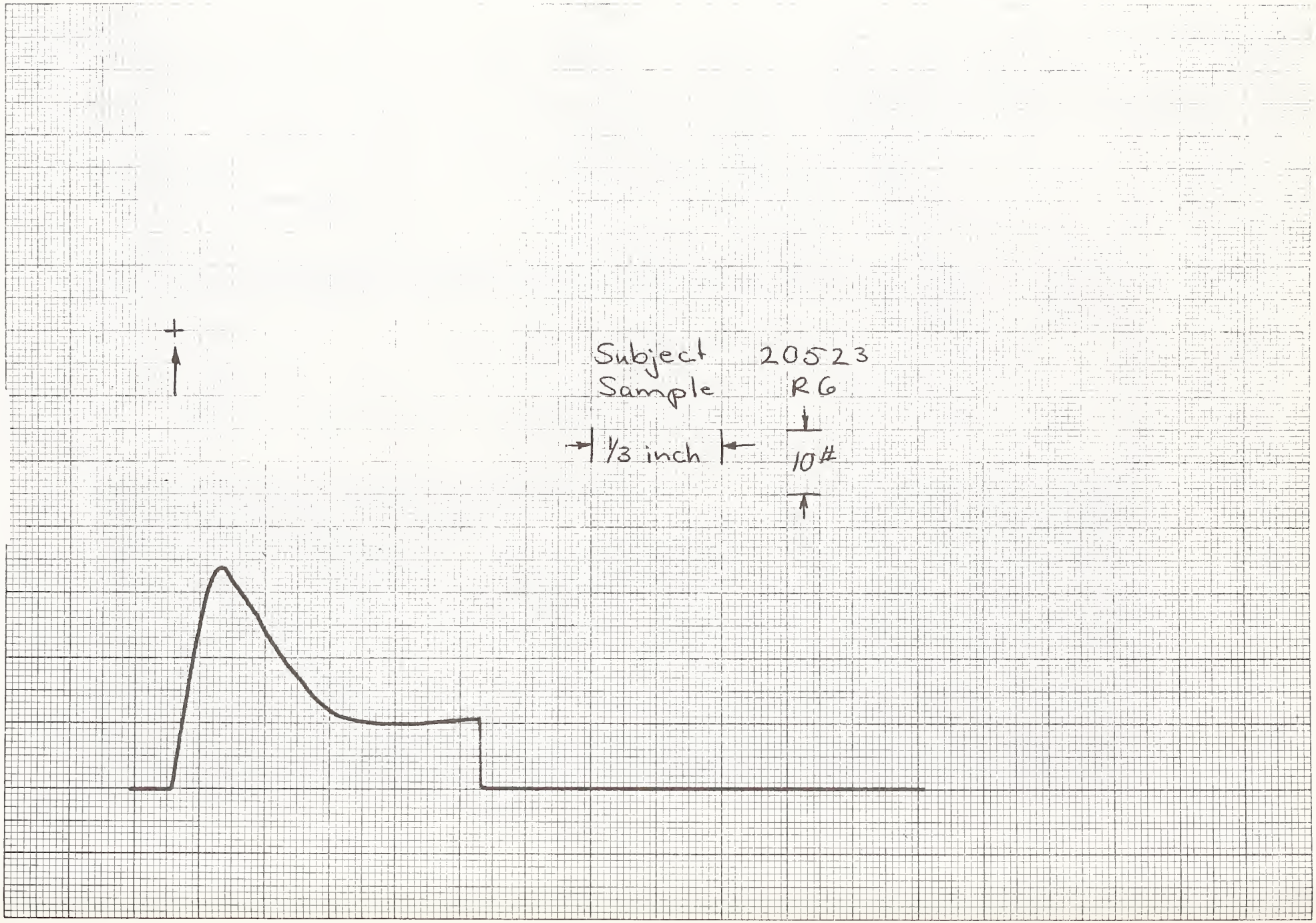
20496 R7
50ths


Subject 20496
Sample R8
1/3 inch
10#

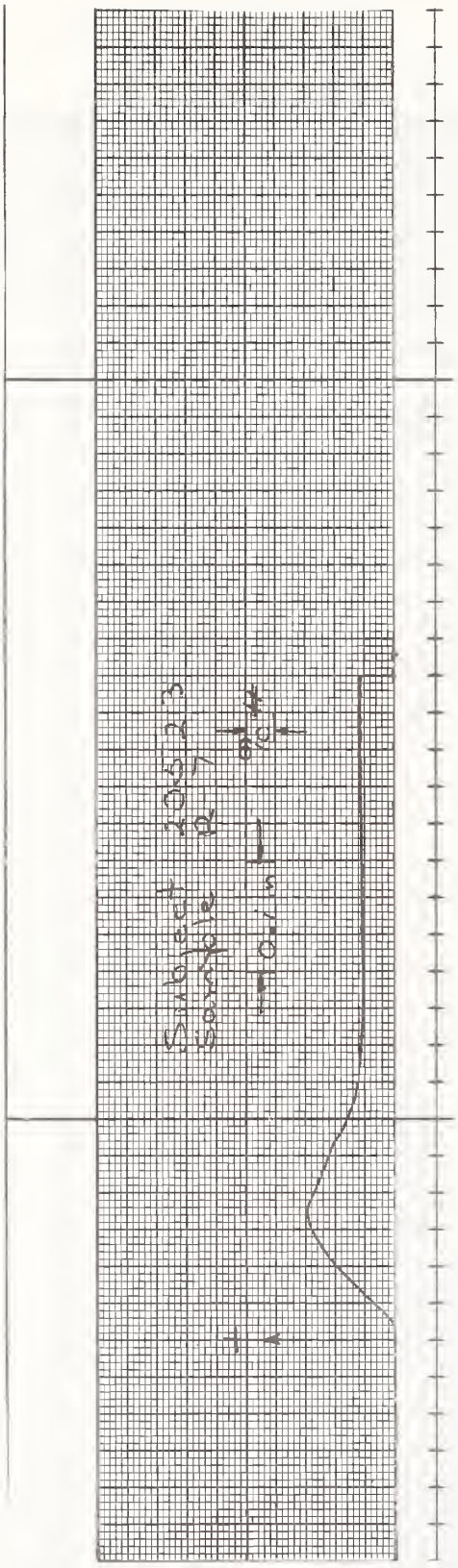
20496 R8
50ths


Subject 20523
Sample R5
1/3 inch
10#

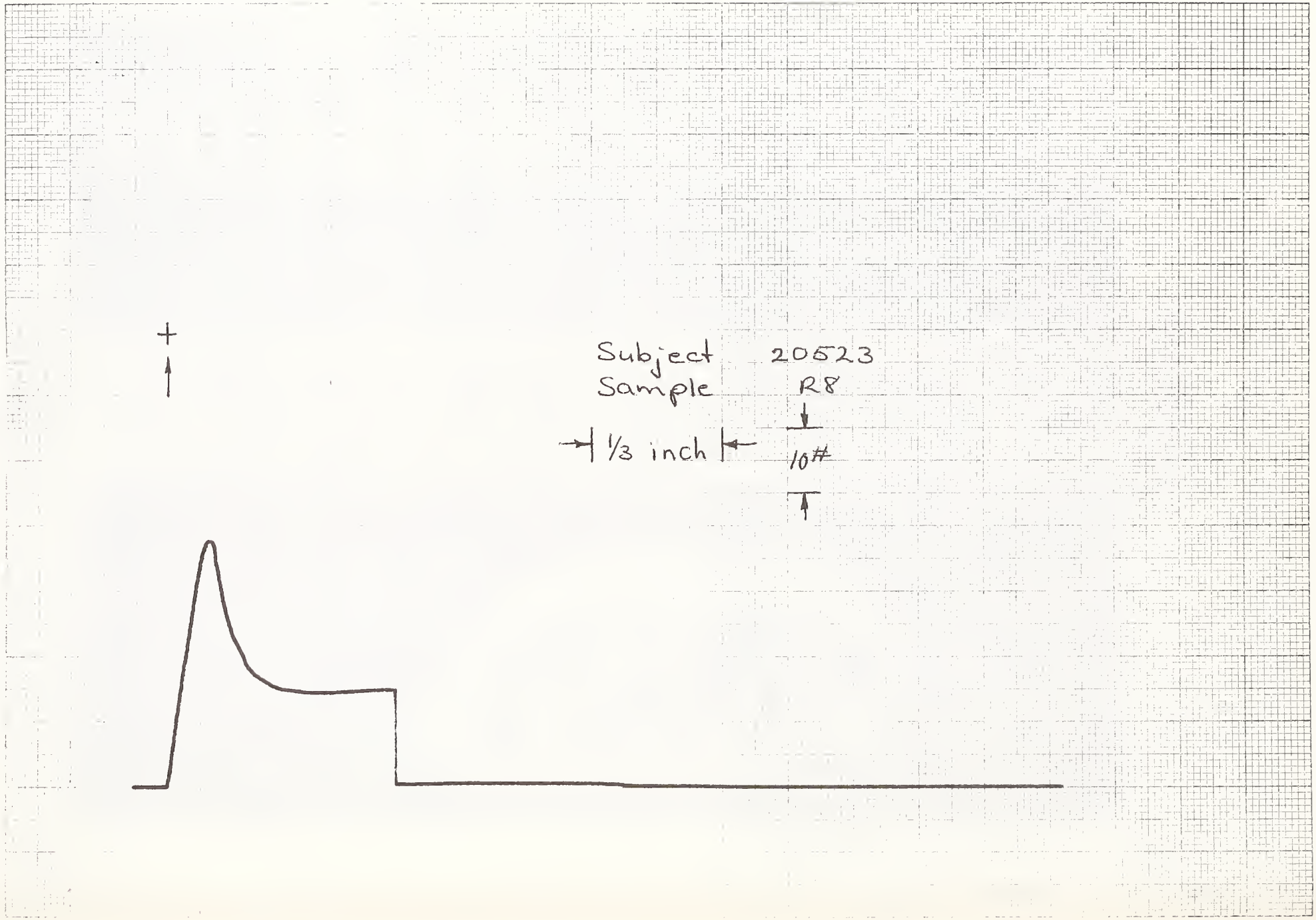
20523 R5
50ths


Subject 20523
Sample RG
1/3 inch
10#

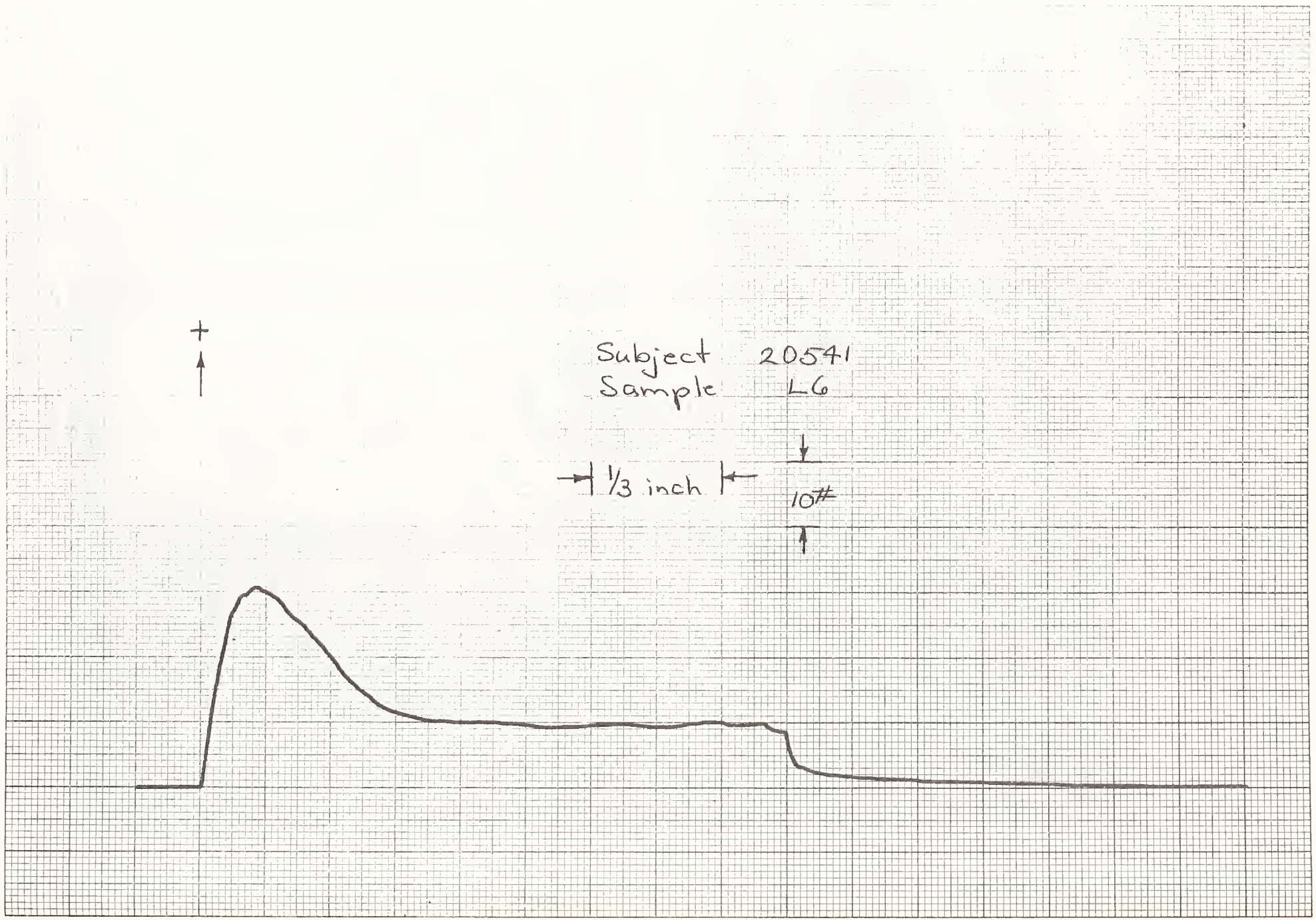
20523 R6
50ths



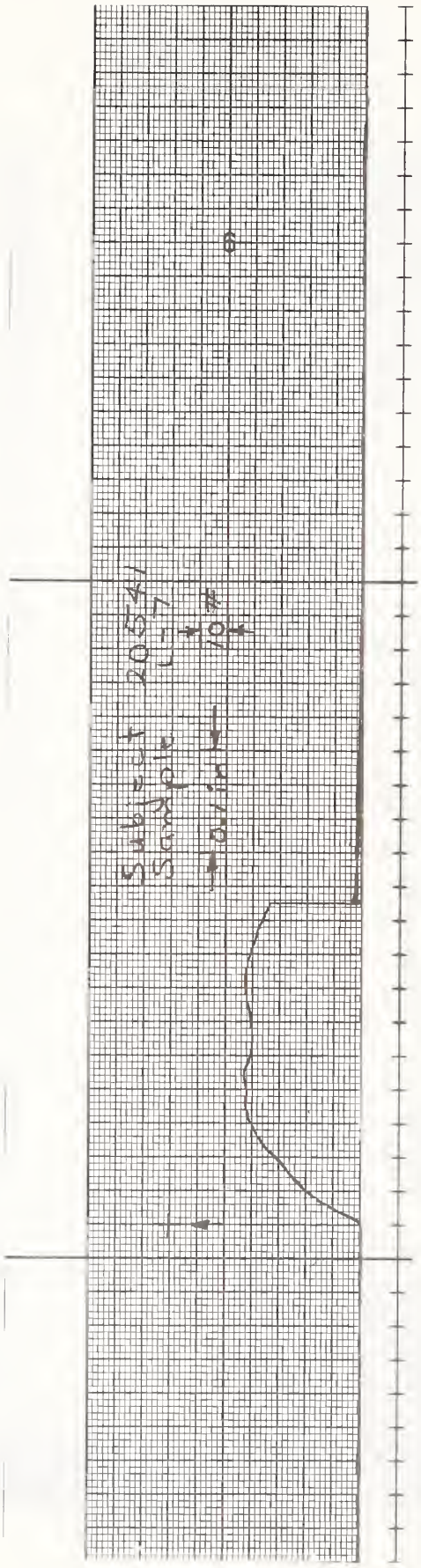
20523 R7

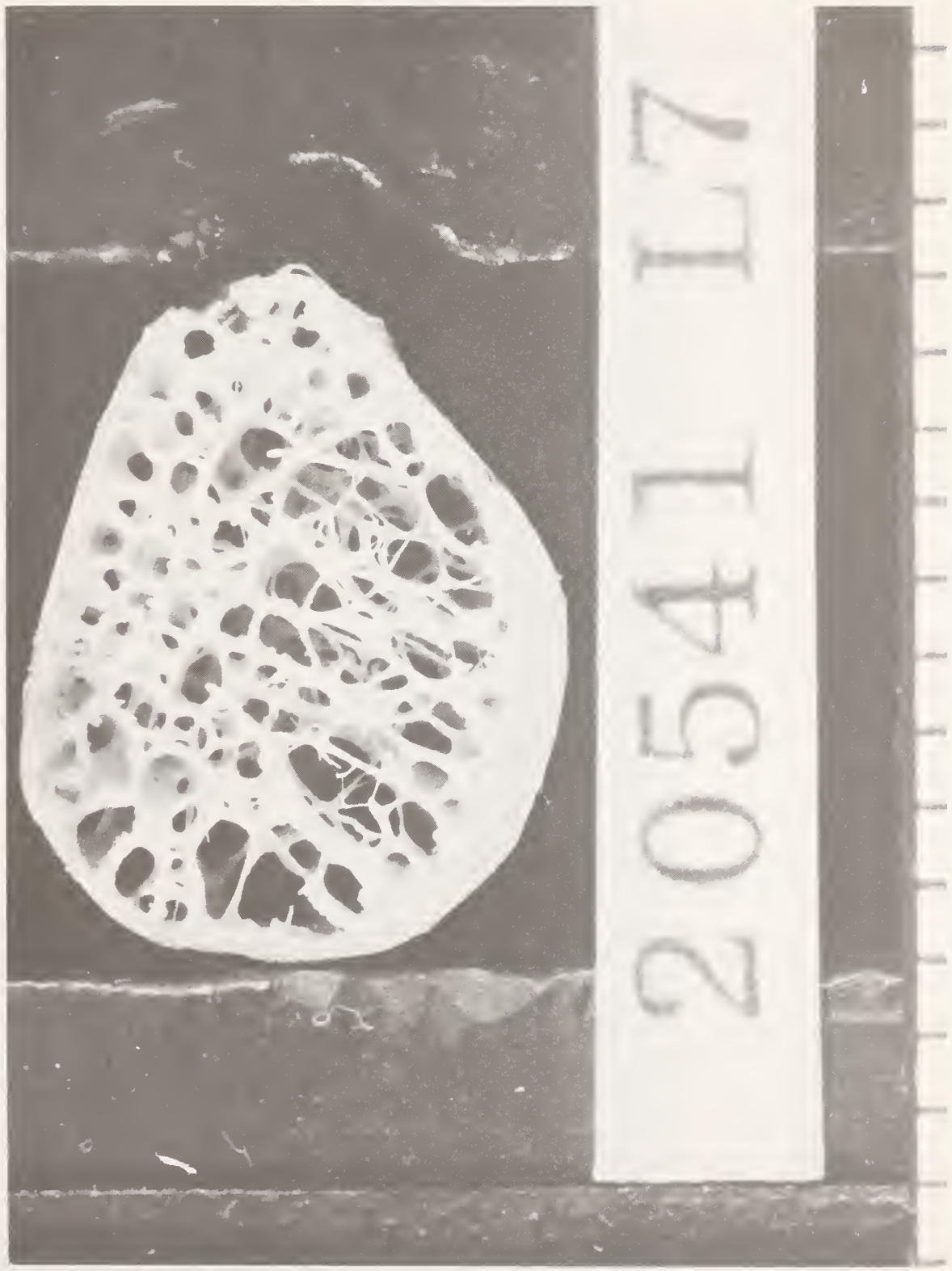

Subject 20523
Sample R8
1/3 inch
10#

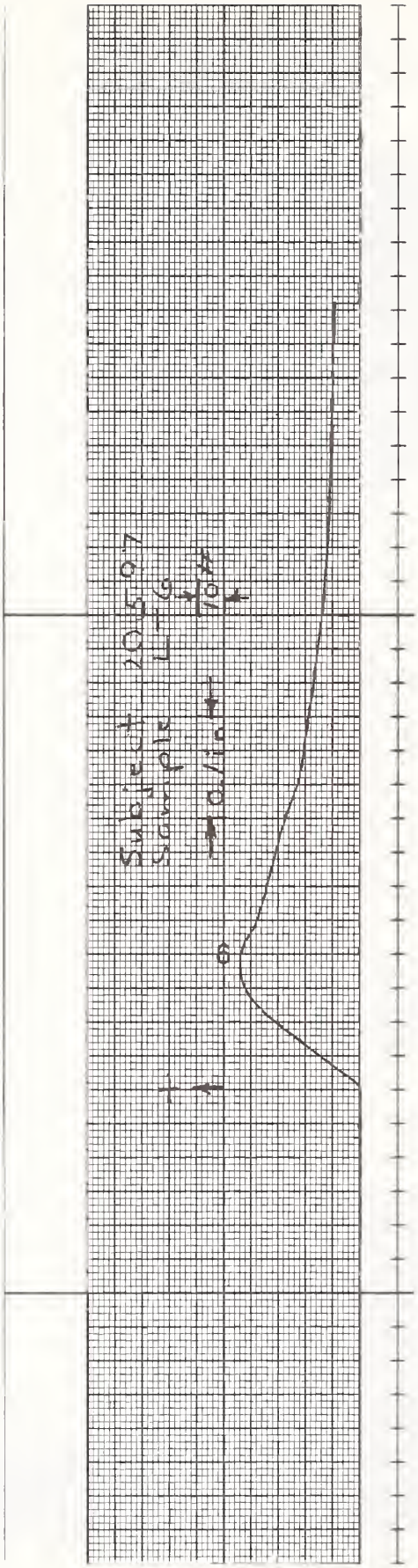
20523 R8
50ths


Subject 20541
Sample L6
⅓ inch
10#

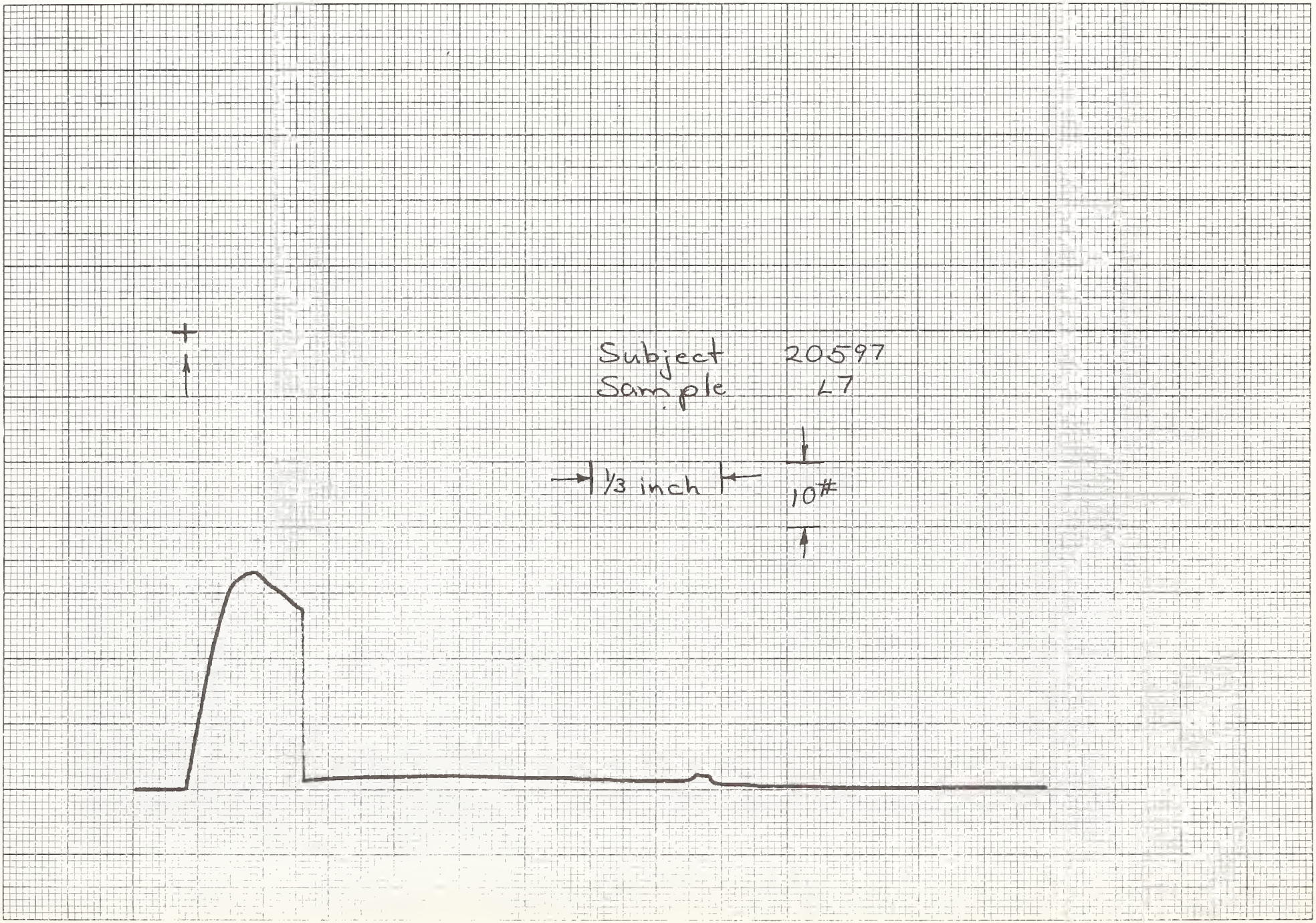
20541 L6
5 4 3 2



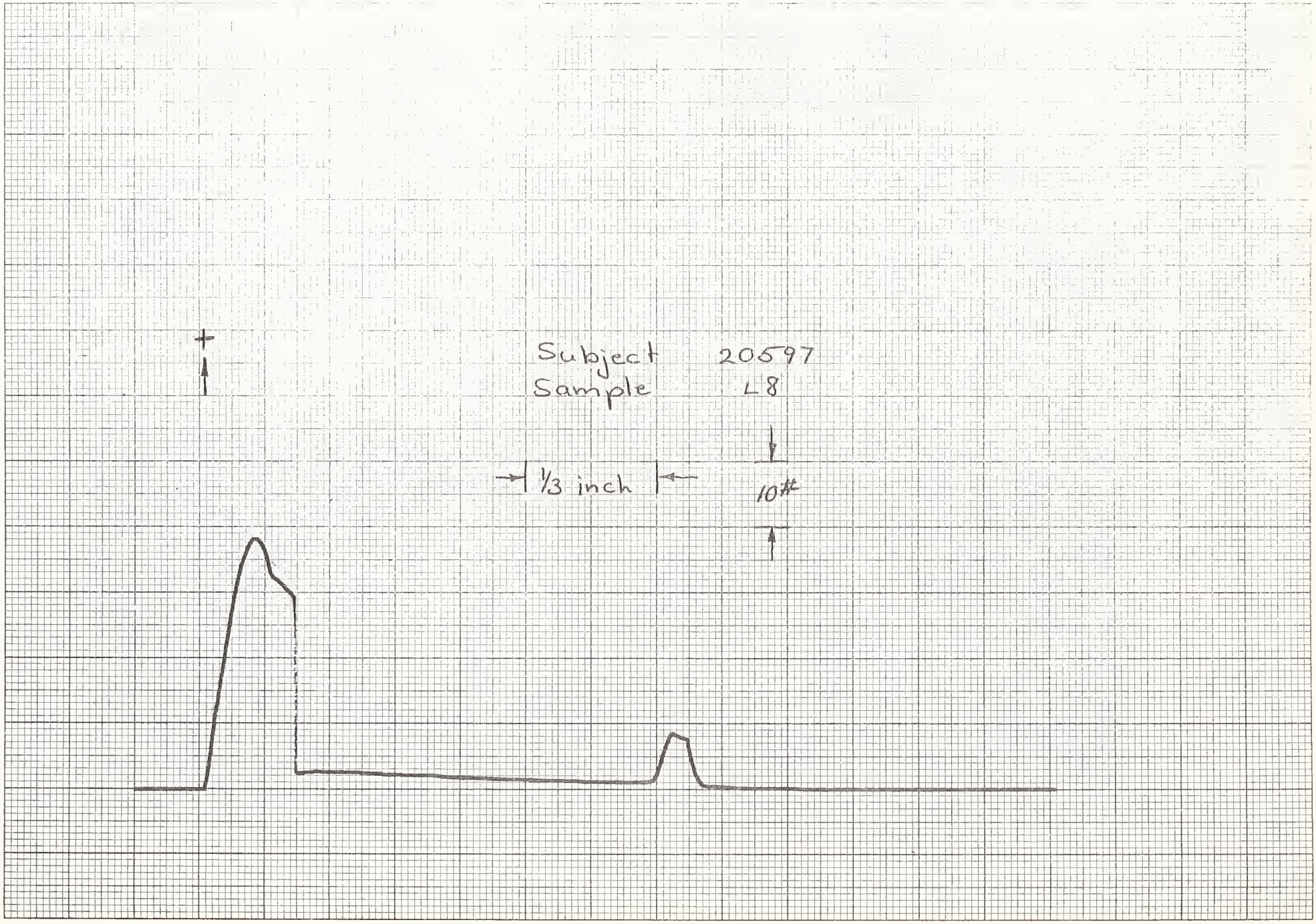

20541 17


6

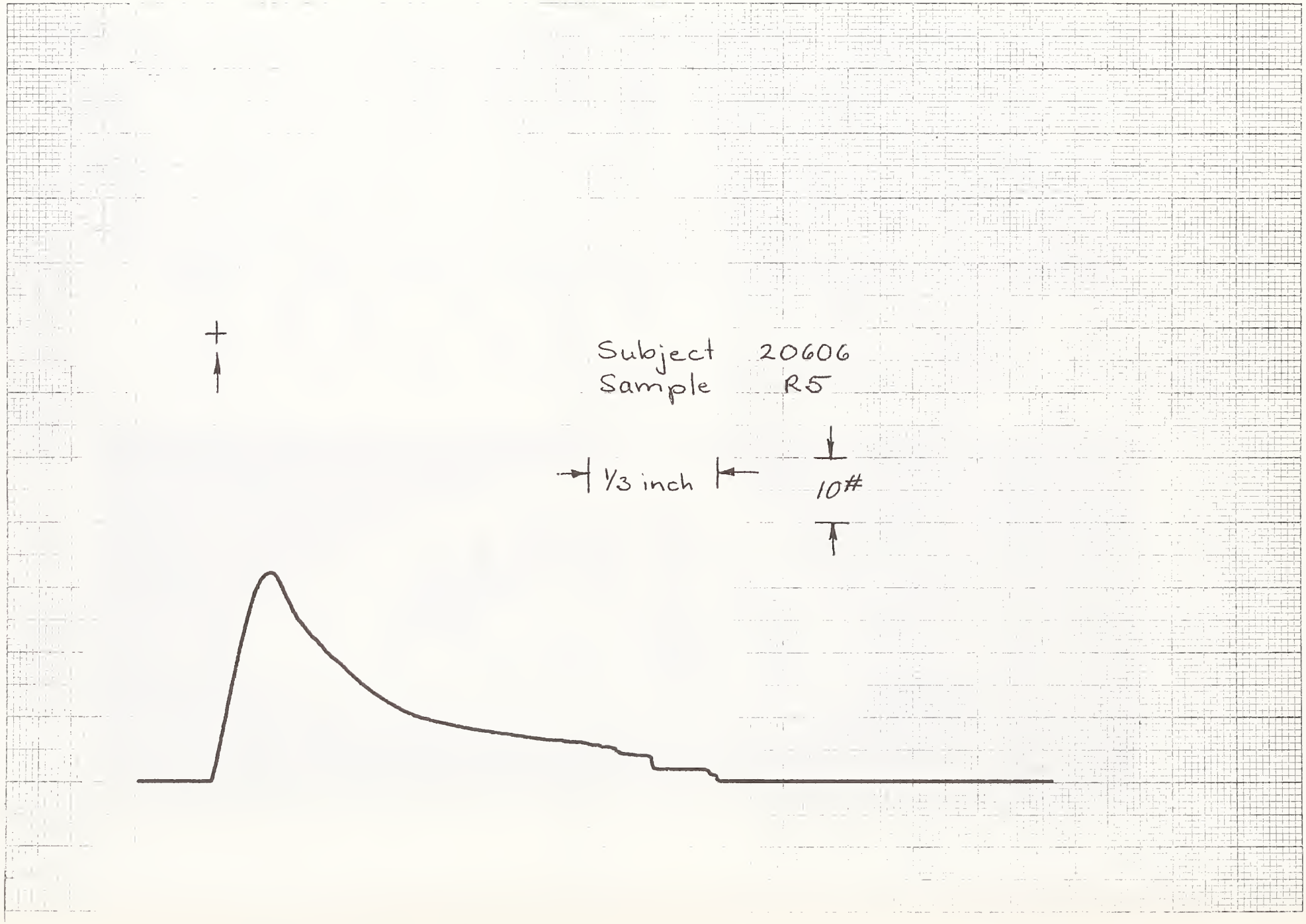
20597
1
INCHES


Subject
Sample
20597
47
1/3 inch
10#

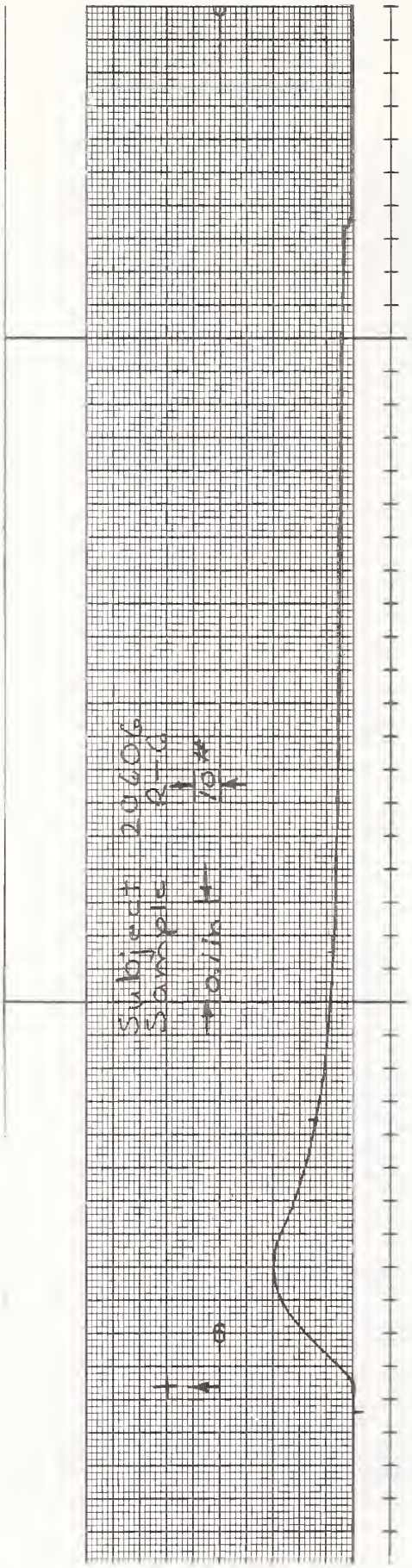
20597 L7
50ths

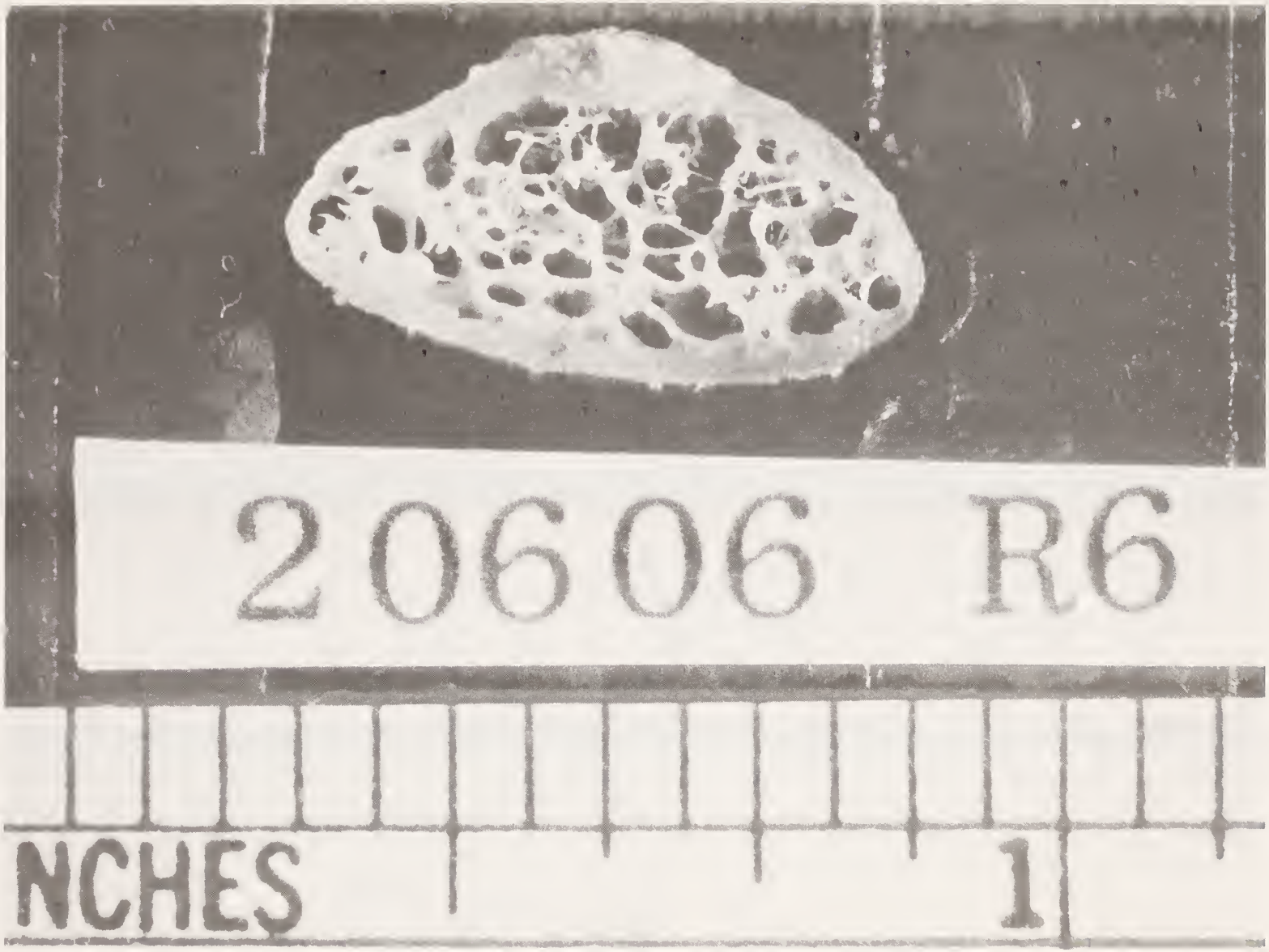

Subject 20597
Sample L8
⅓ inch
10#

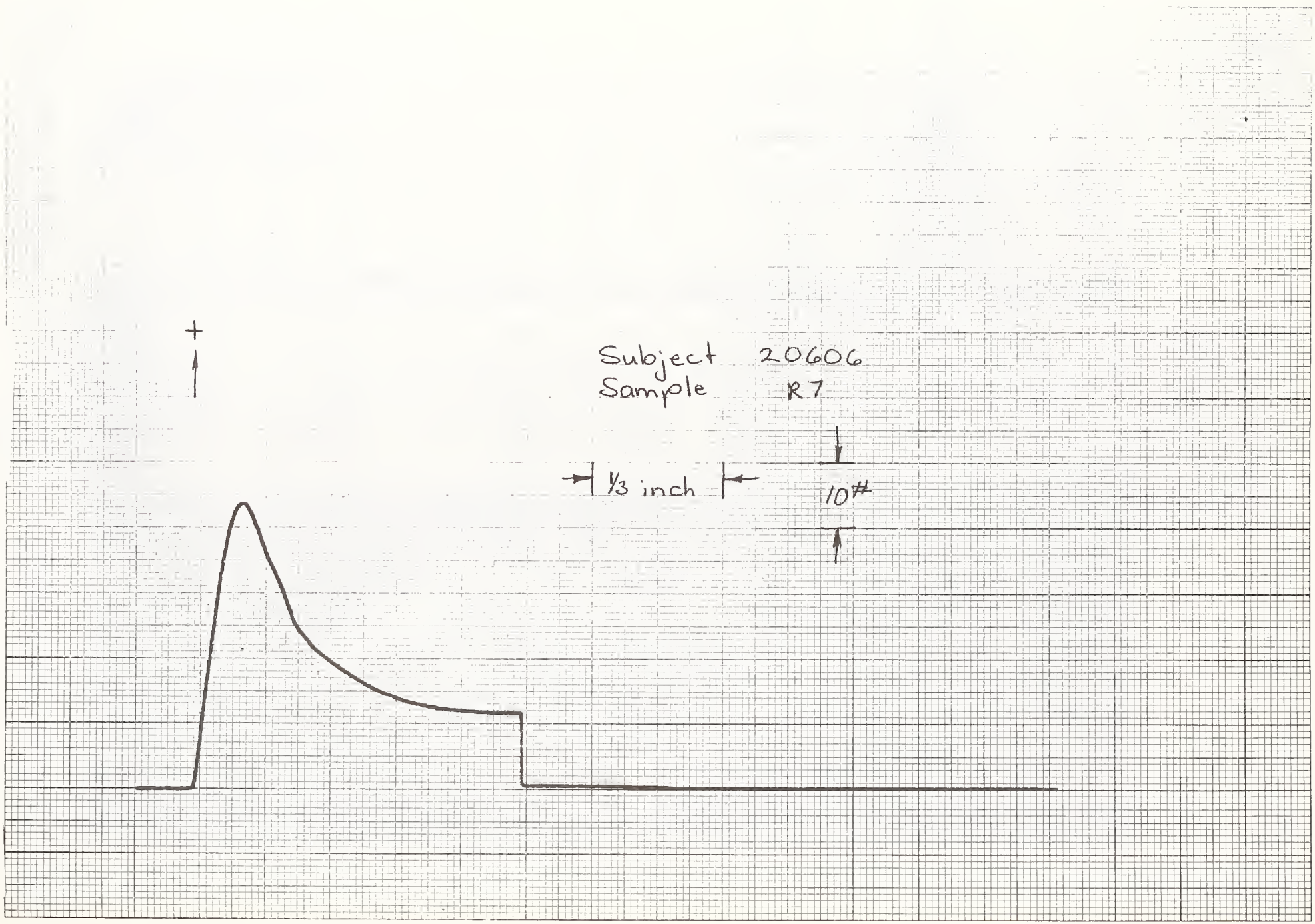
20597 L8
50ths

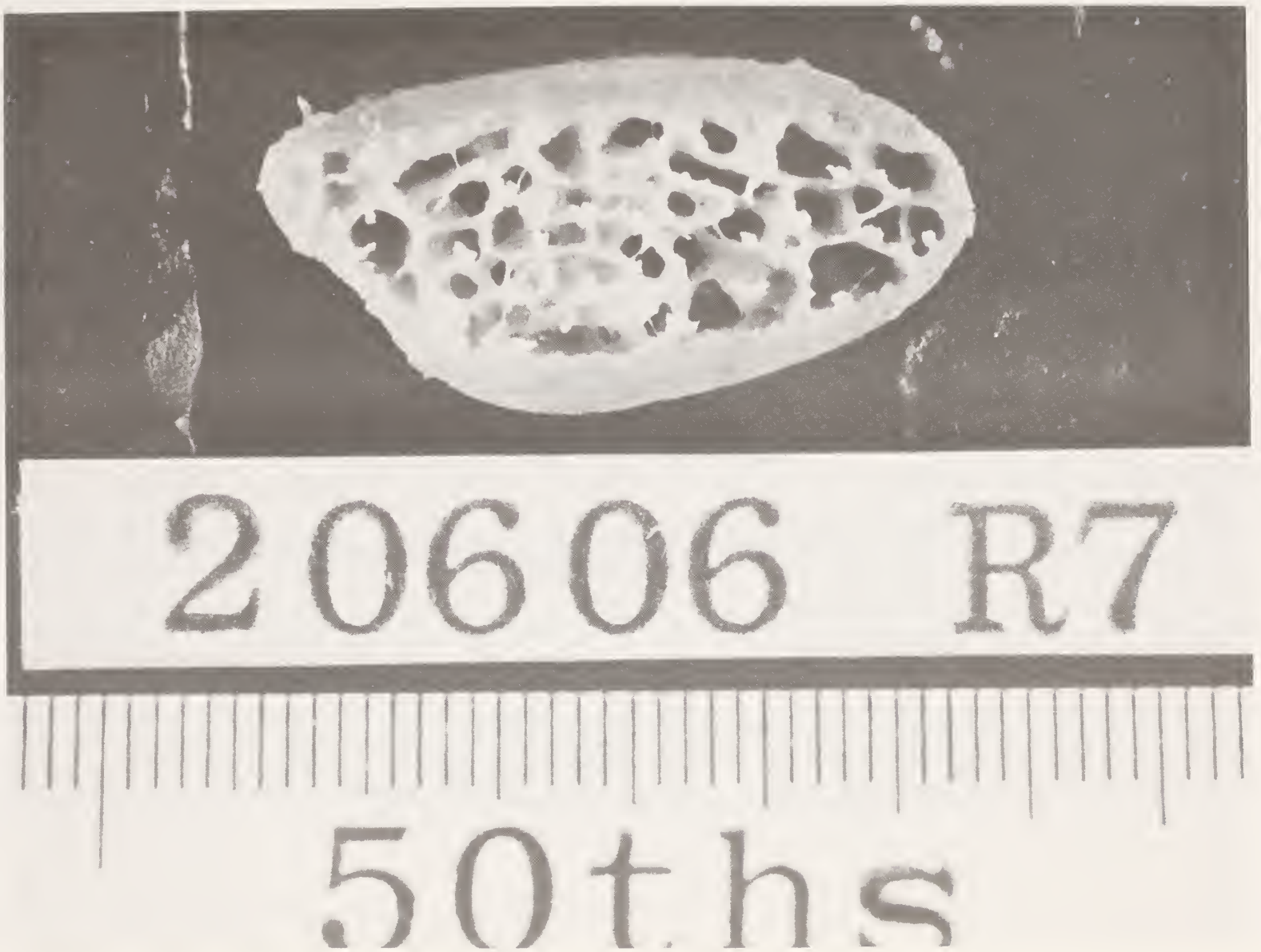

Subject 20606
Sample R5
1/3 inch
10#

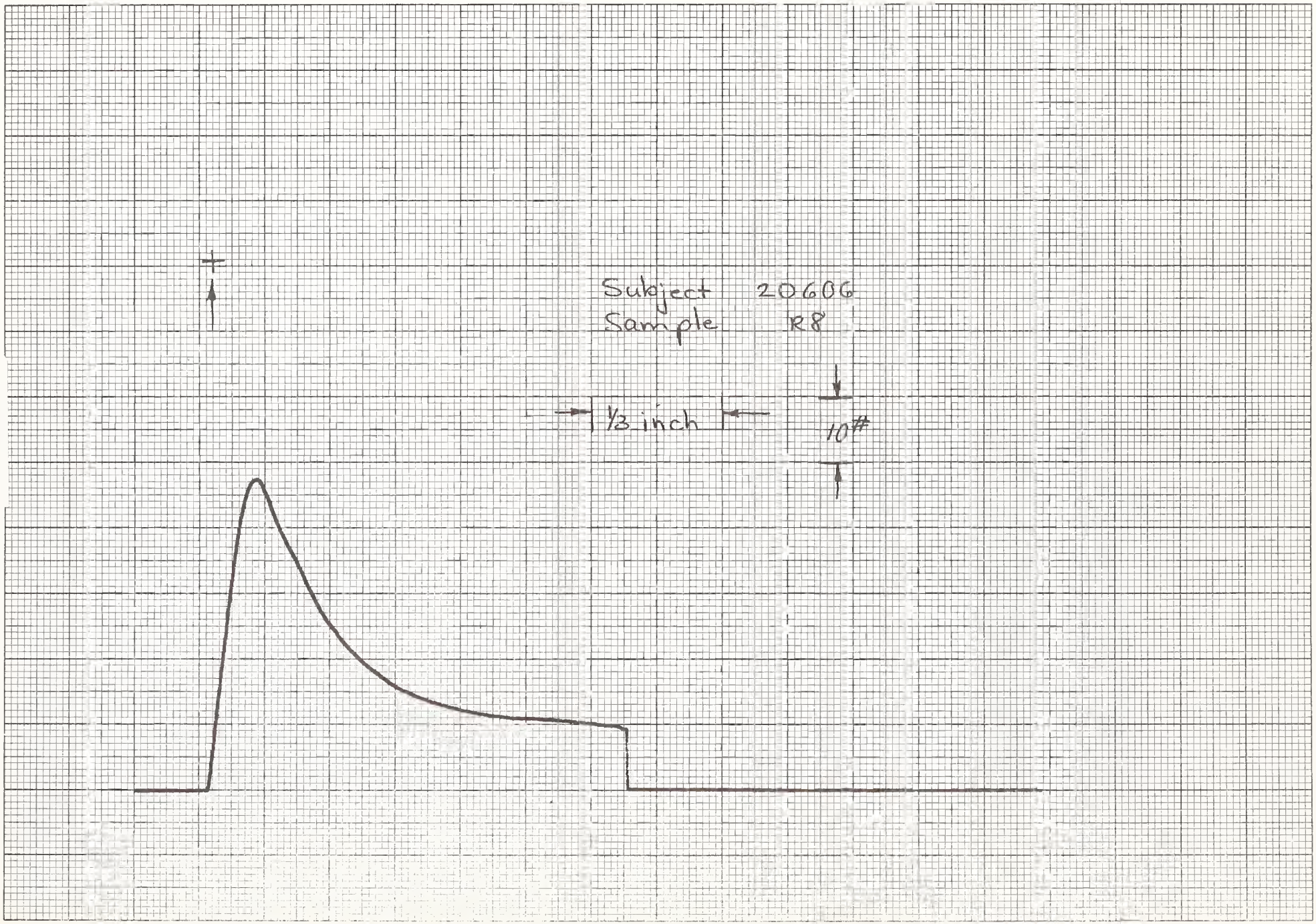
20606 R5
50ths

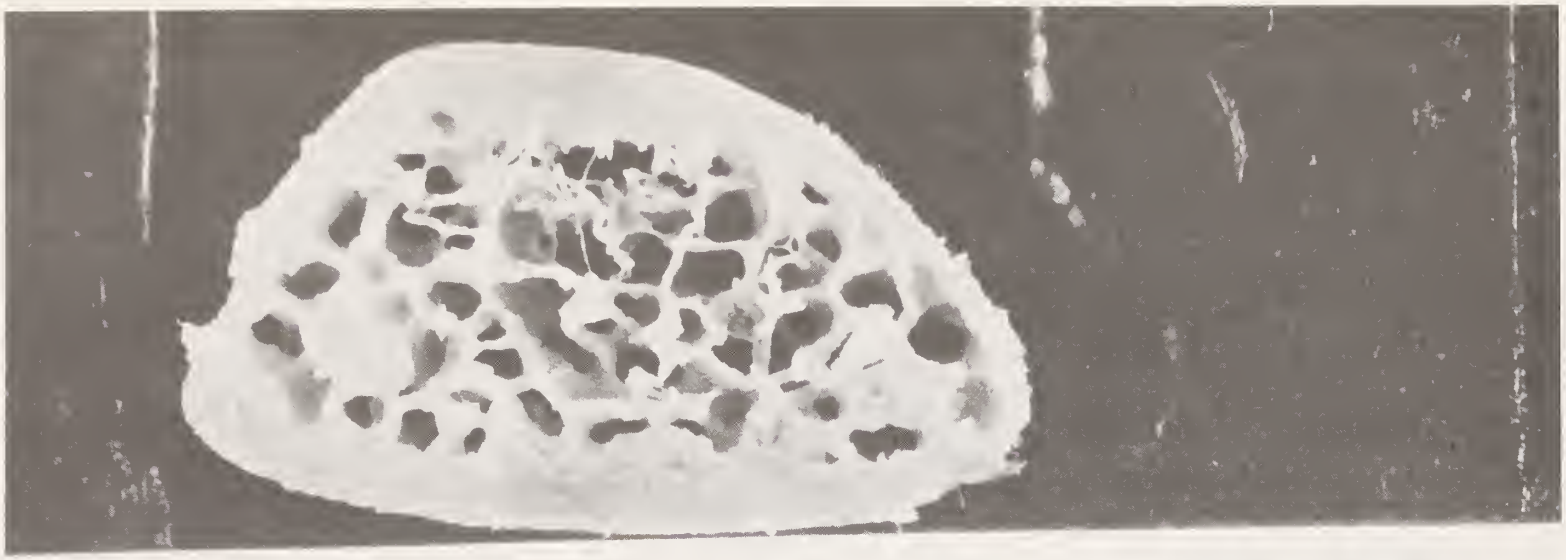



20606 R6
NCHES
1


Subject 20606
Sample R7
1/3 inch
10#

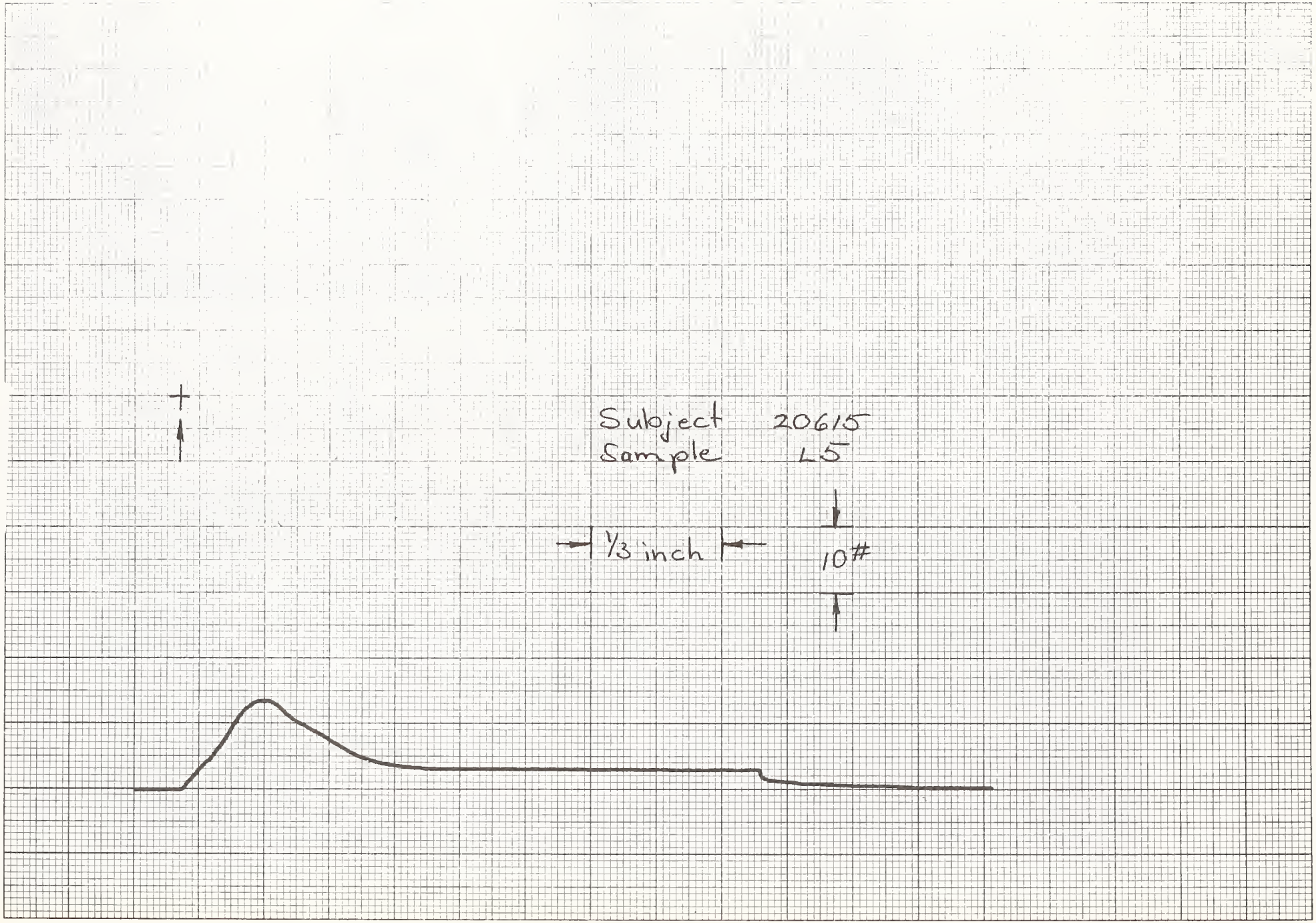

20606 R7
50ths


Subject 20606
Sample R8
⅓ inch
10#

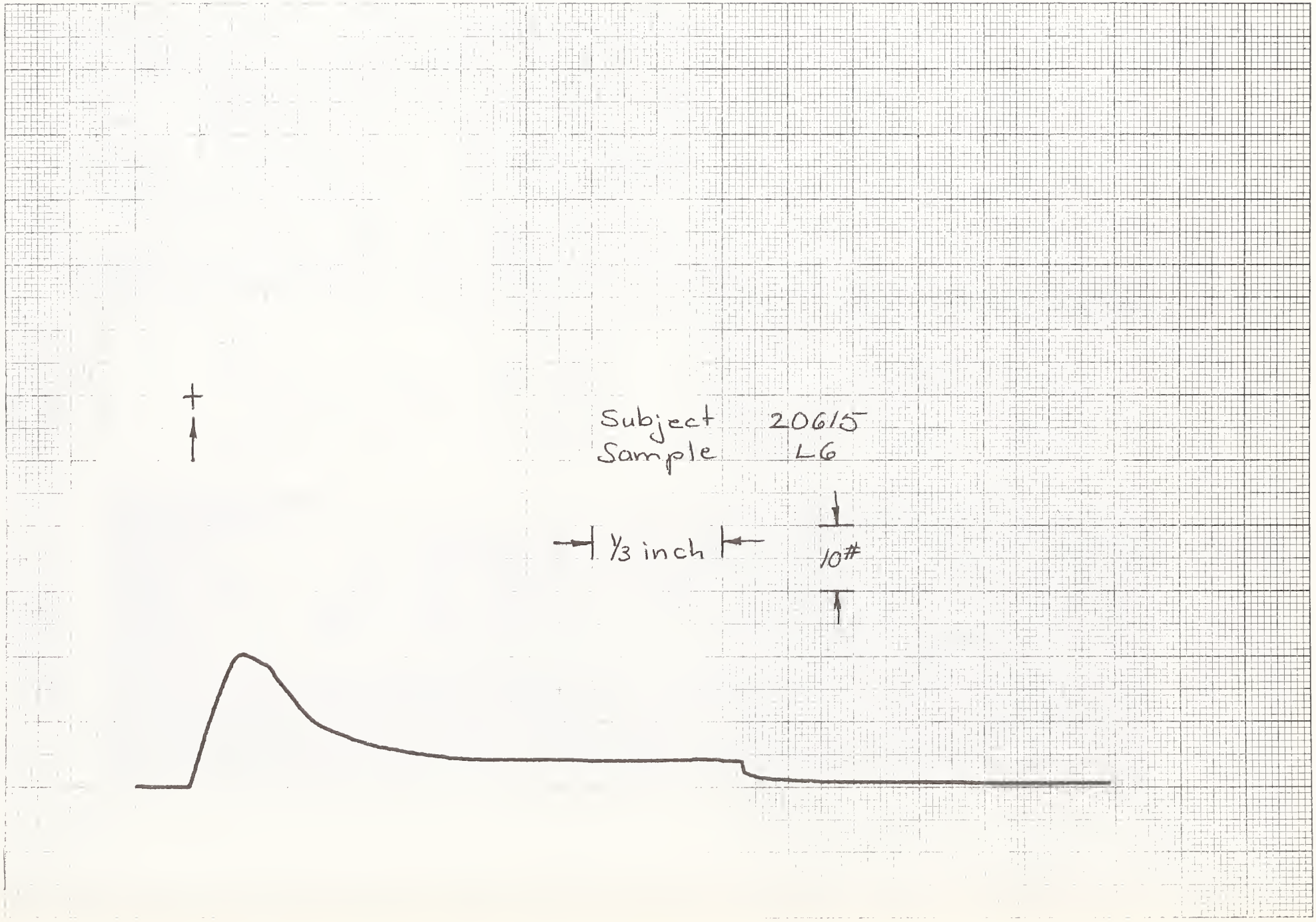


20606 R8

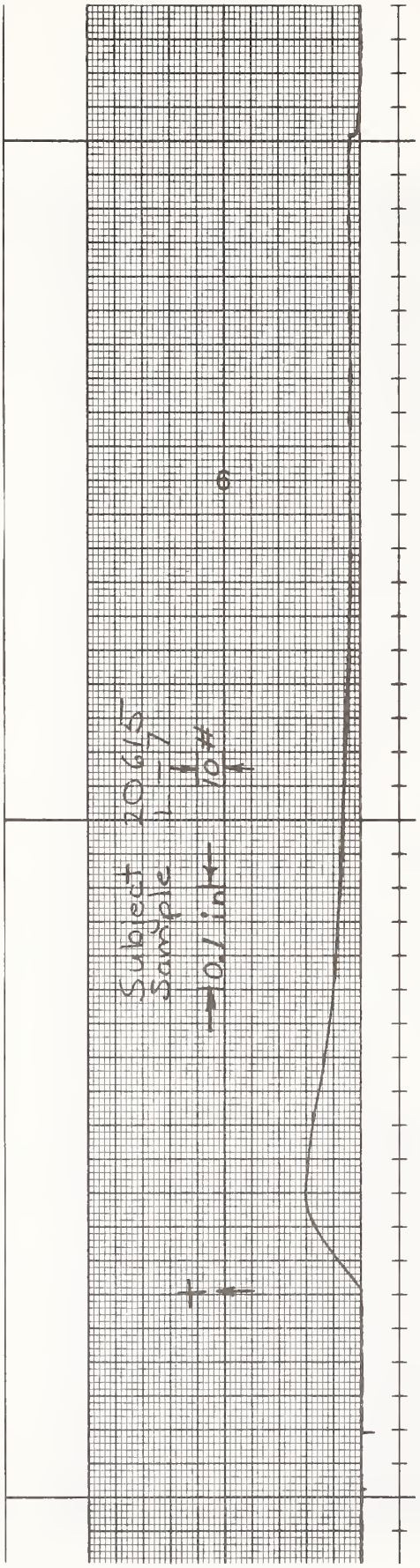
50ths


Subject
Sample
20615
L5
1/3 inch
10#

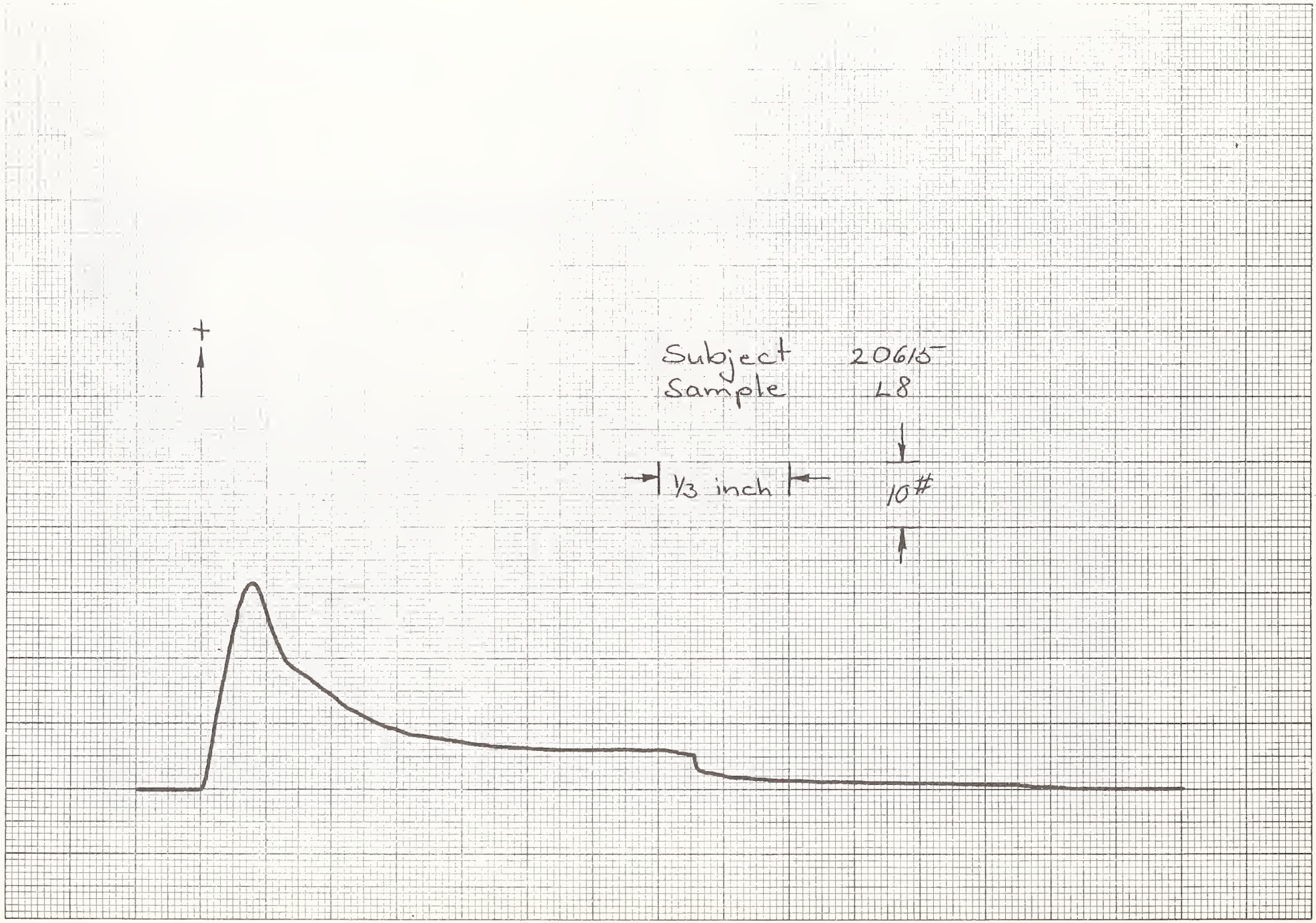
20615 L5
50ths


Subject 20615
Sample L6
1/3 inch
10#

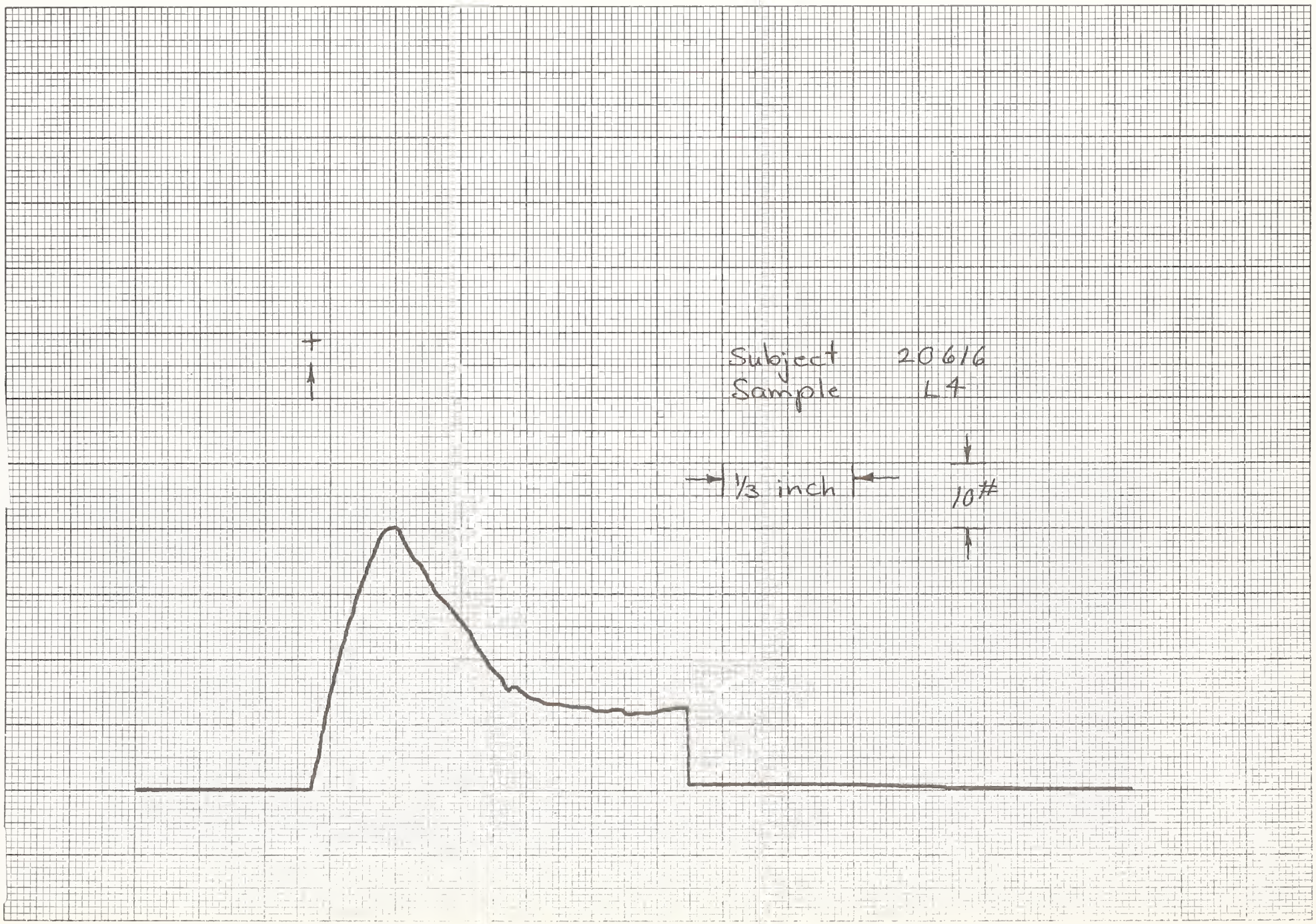
20615 L6
50ths


Subject 20275
Sample 1
10#
10/in

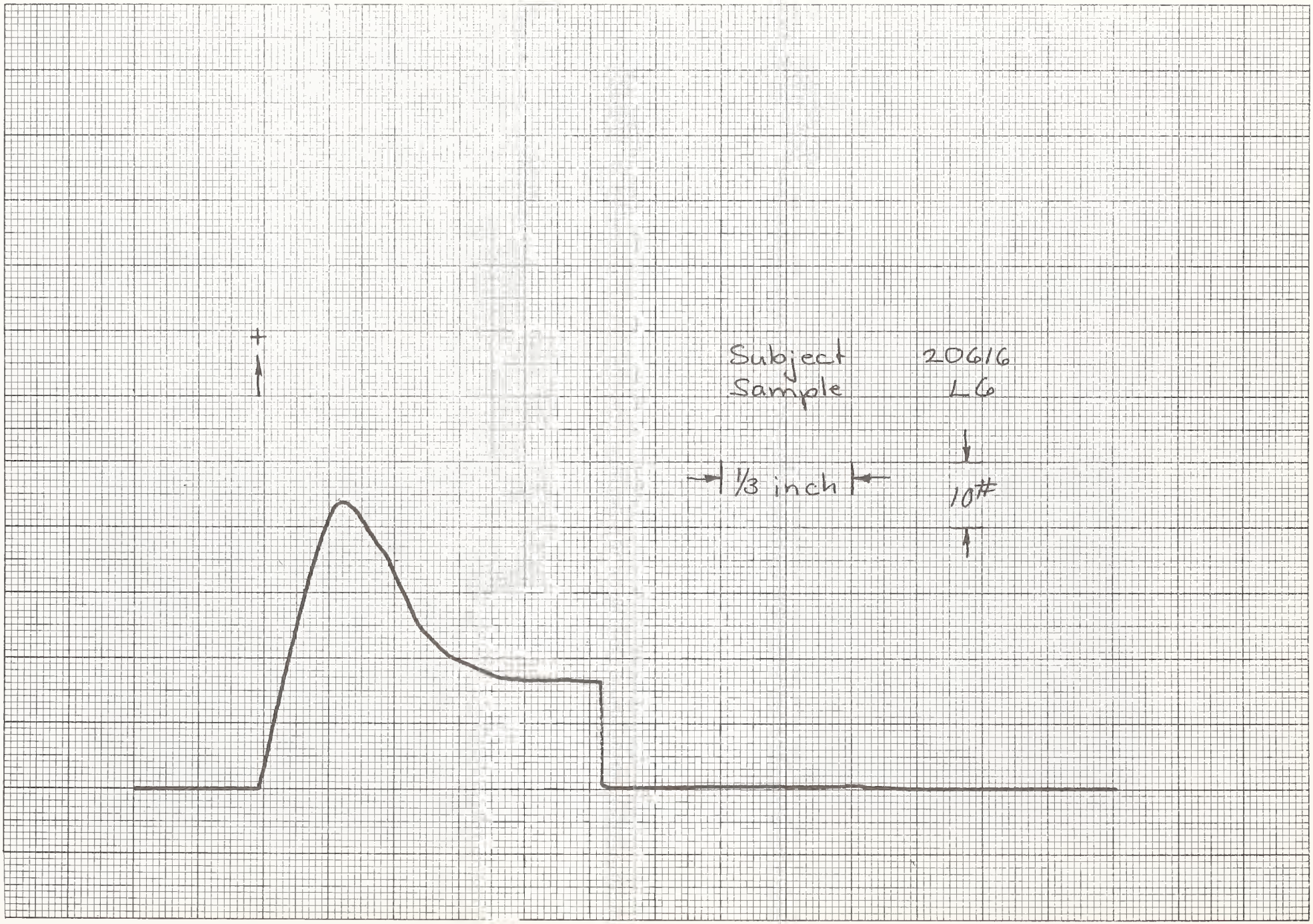
20615 L7
INCHES


Subject
Sample
20615-
L8
1/3 inch
10#

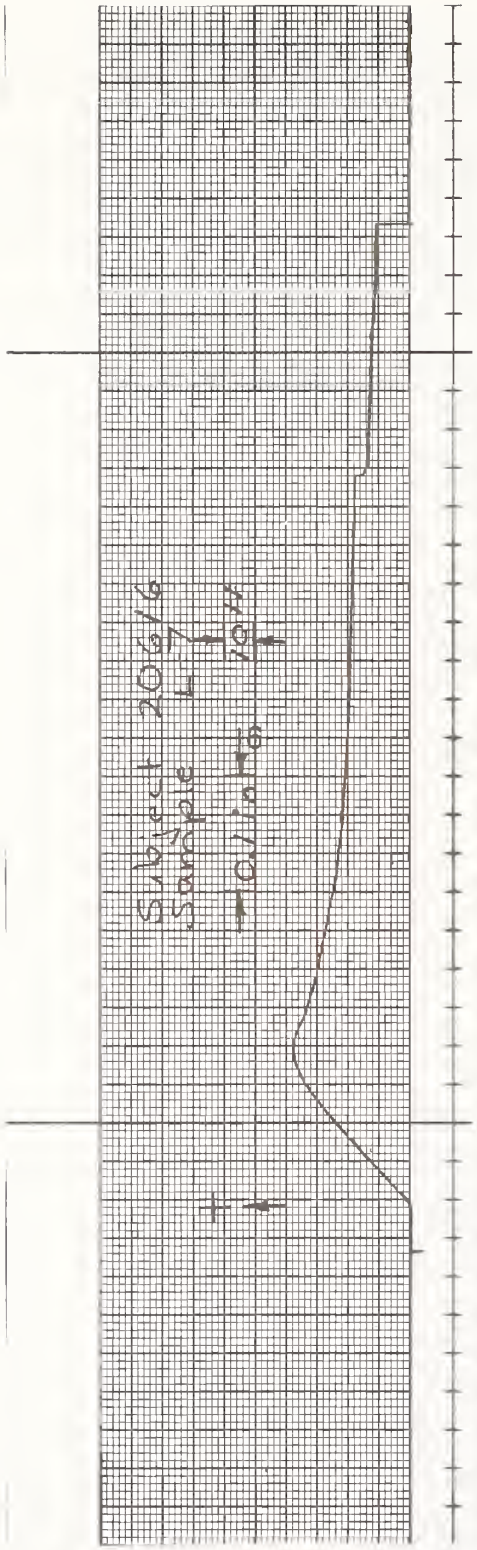
20615 L8
50ths


Subject 20616
Sample L4
⅓ inch
10#

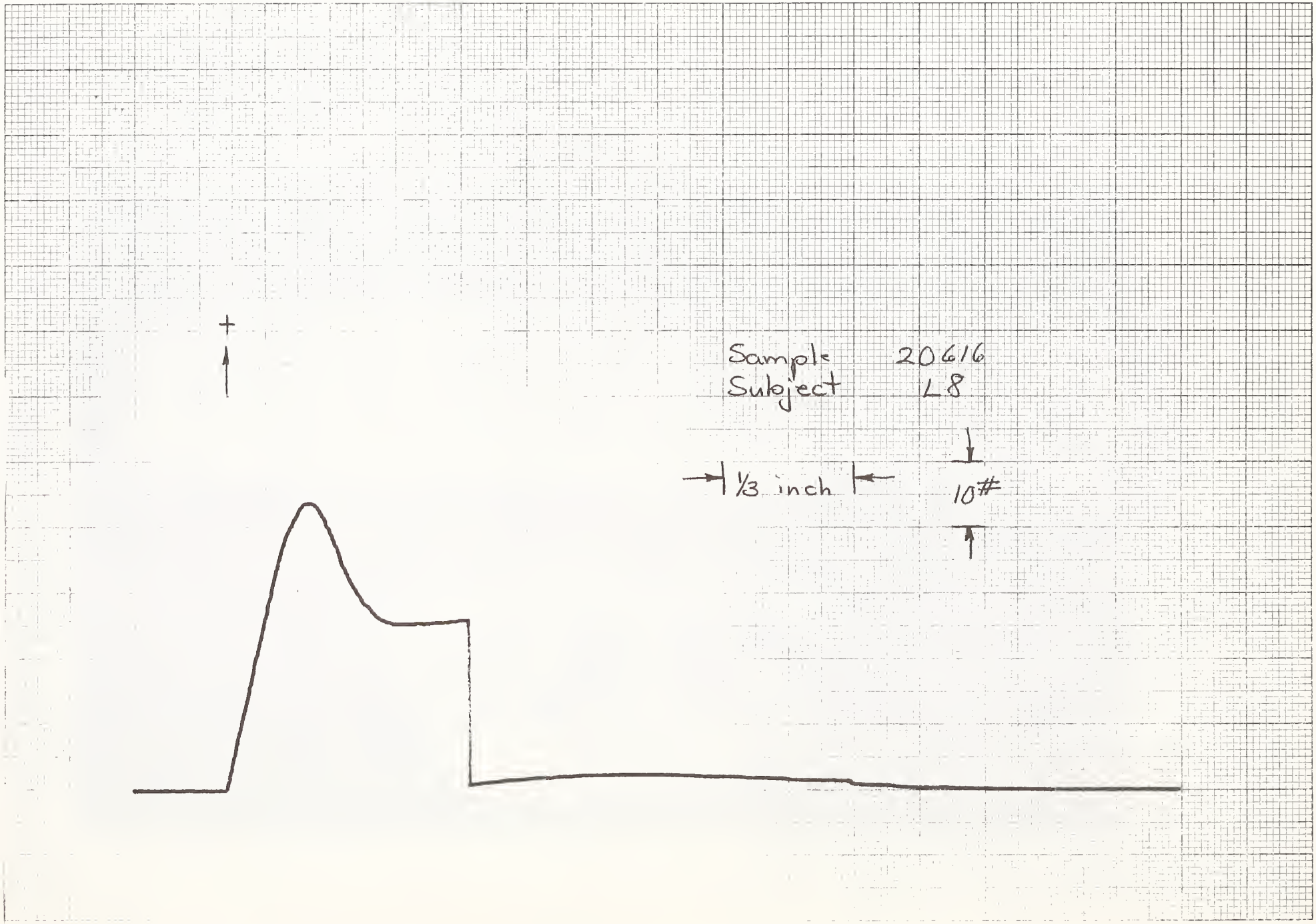
20616 L4
50ths


+
Subject
Sample
20616
LC
1/3 inch
10#

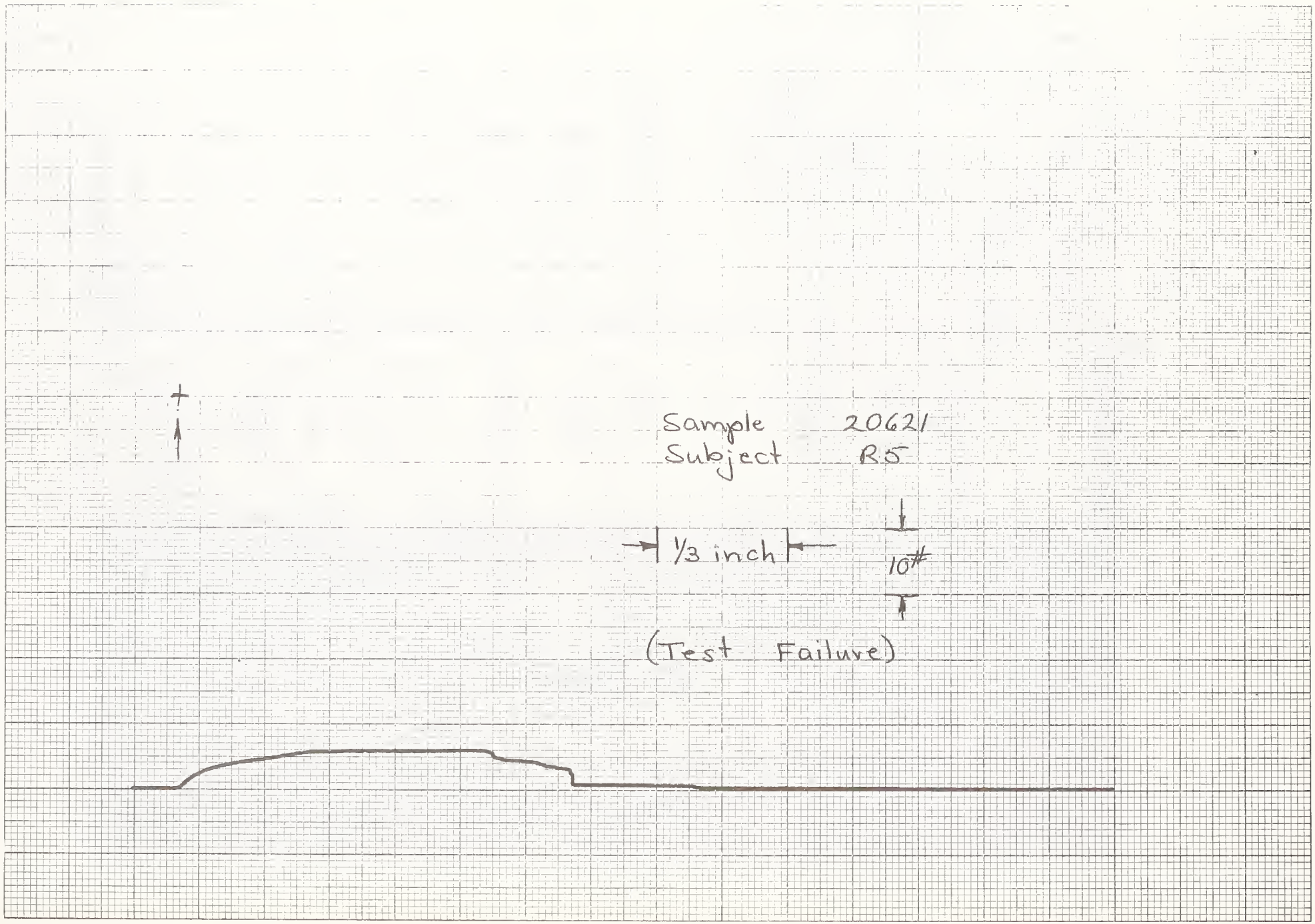
2061 6 L6
50ths


Saturated
Saturated

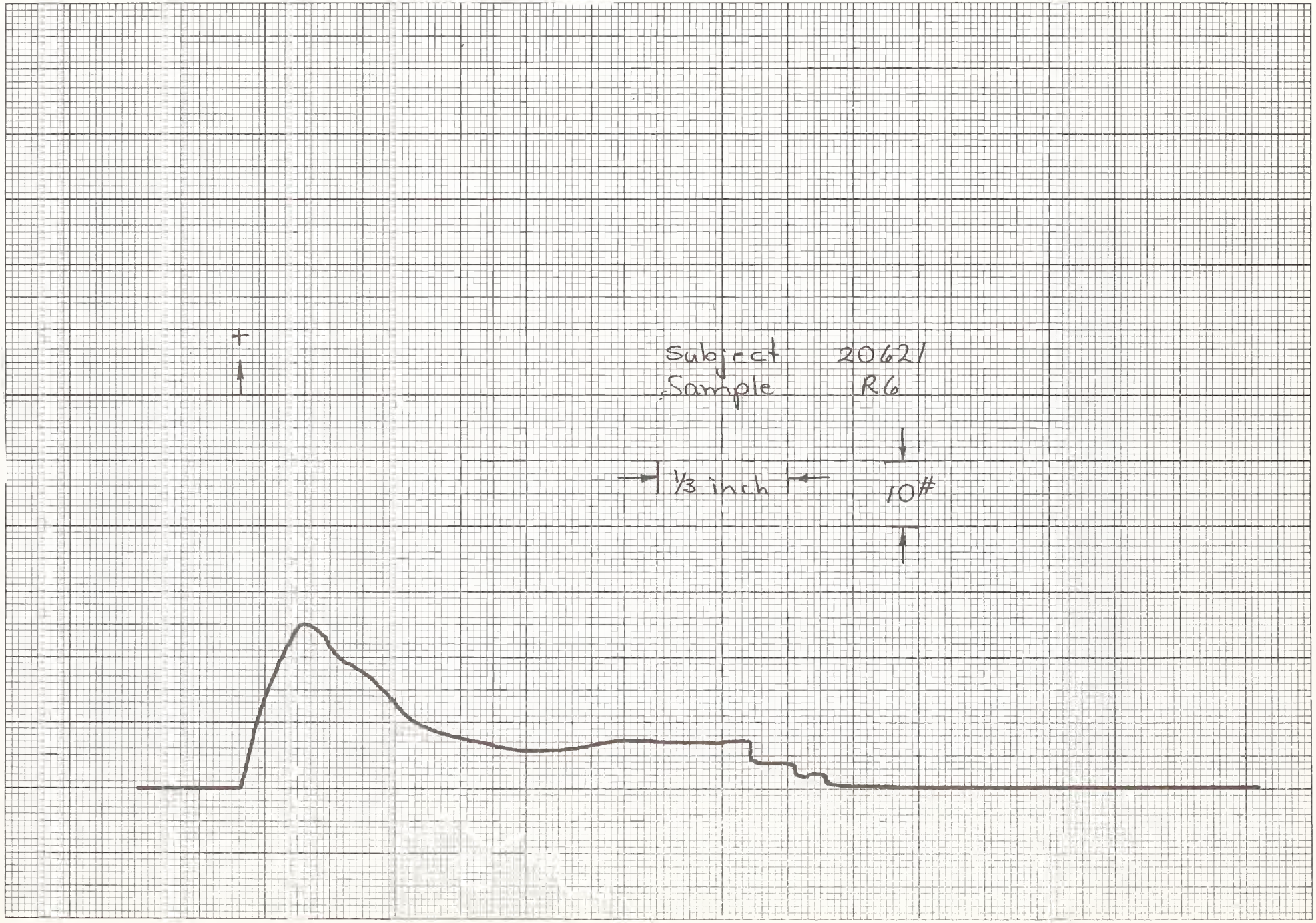
20616 L7


Sample 20616
Subject L8
⅓ inch
10#

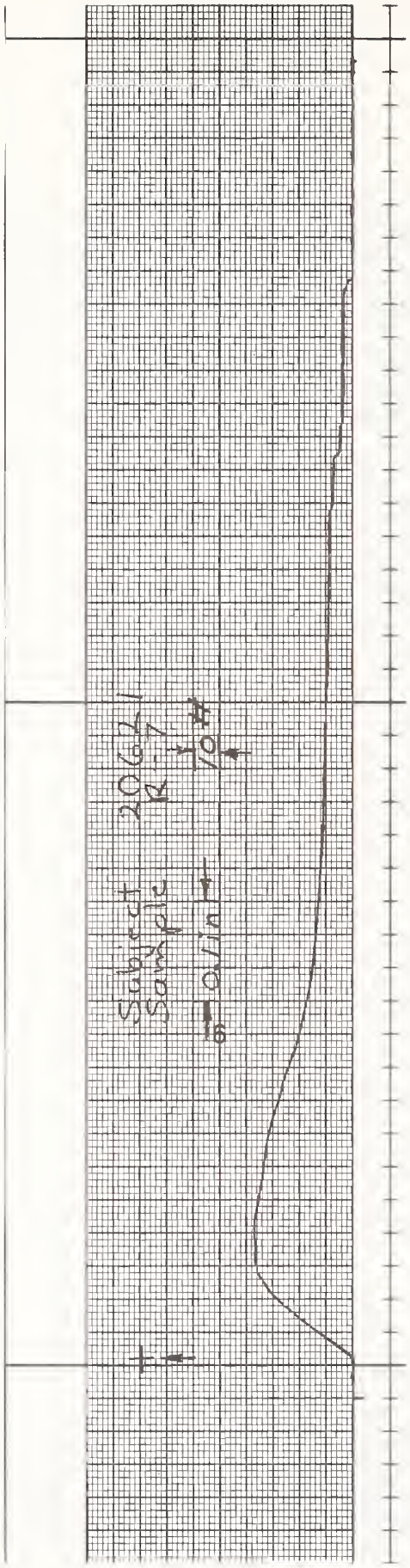
2061 L8
50ths


Sample 20621
Subject R5
⅓ inch
10#
(Test Failure)

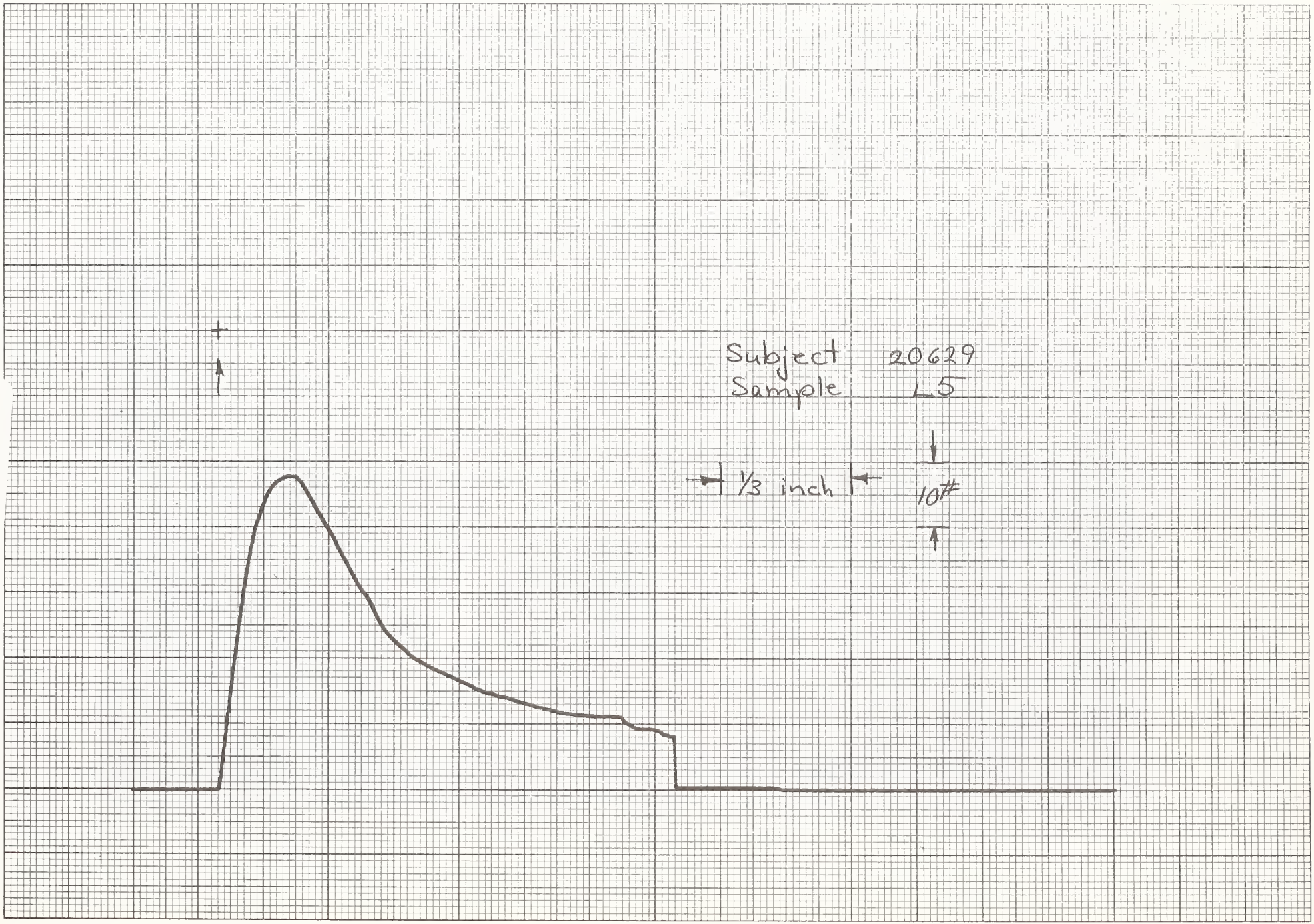
2062 1 R5
50ths


Subject
Sample
20621
R6
1/3 inch
10#

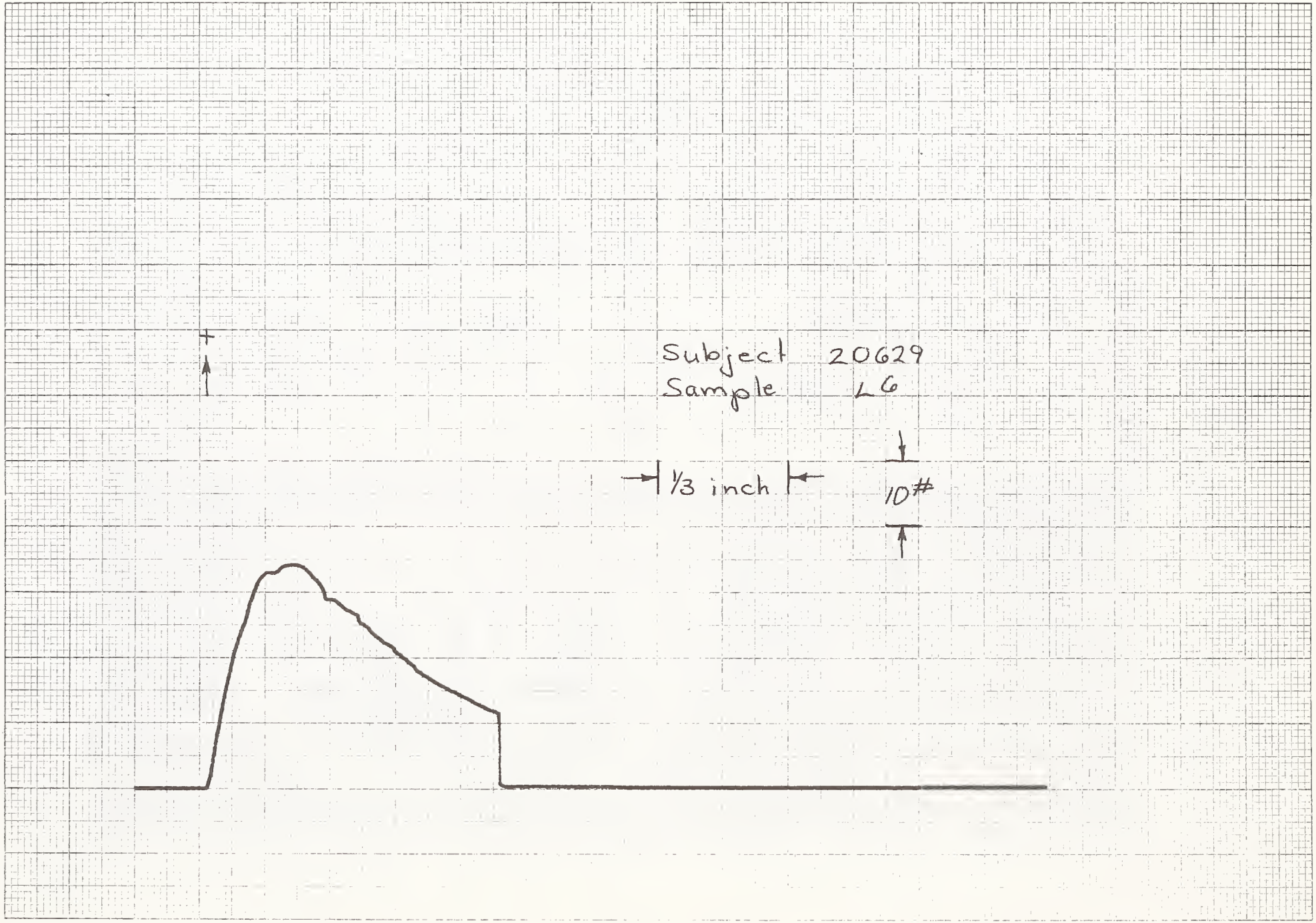
20621 R6
50ths


Subject
Sample
20(62)
R
70
1/5
0
16

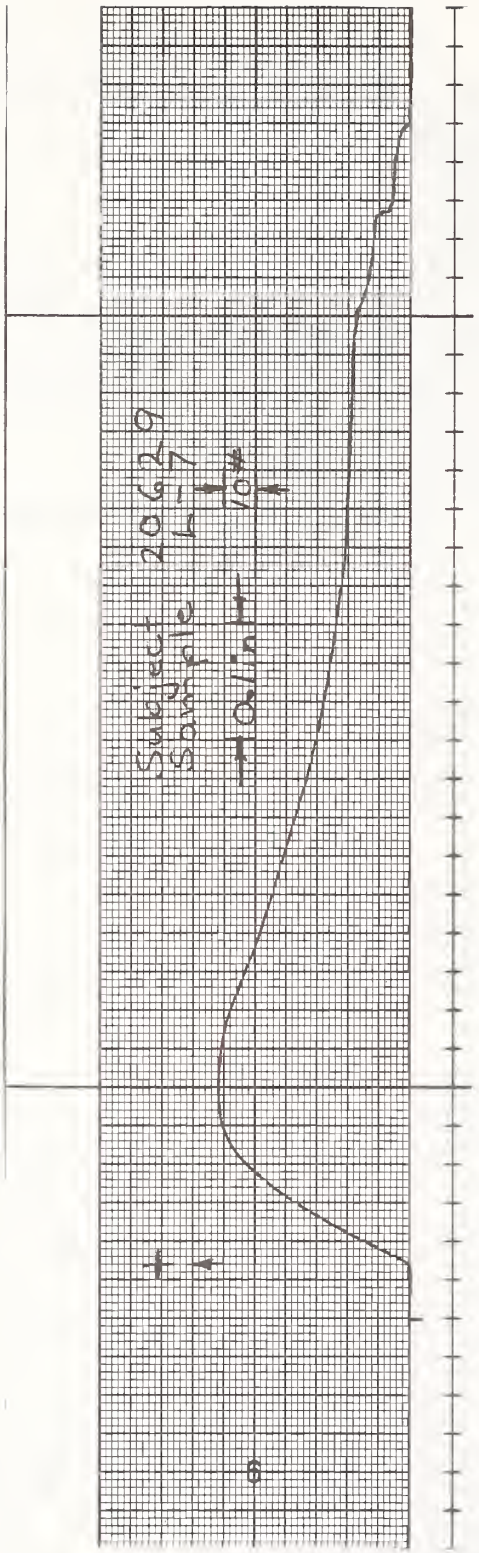
20621 R7
INCHES
1


Subject 20629
Sample L5
⅓ inch
10#

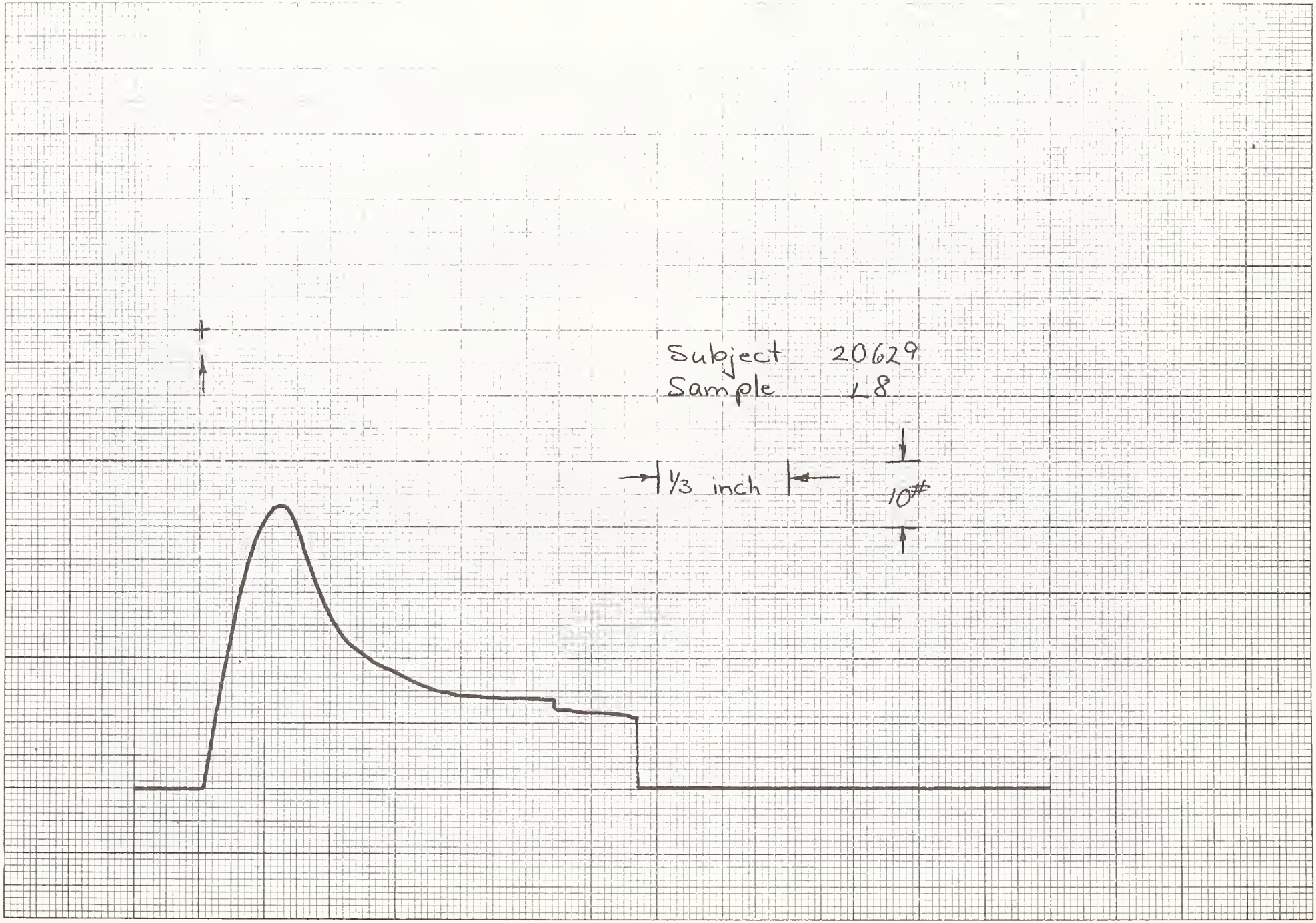
20629 L5
5 0 + h s


Subject 20629
Sample L6
⅓ inch
10#

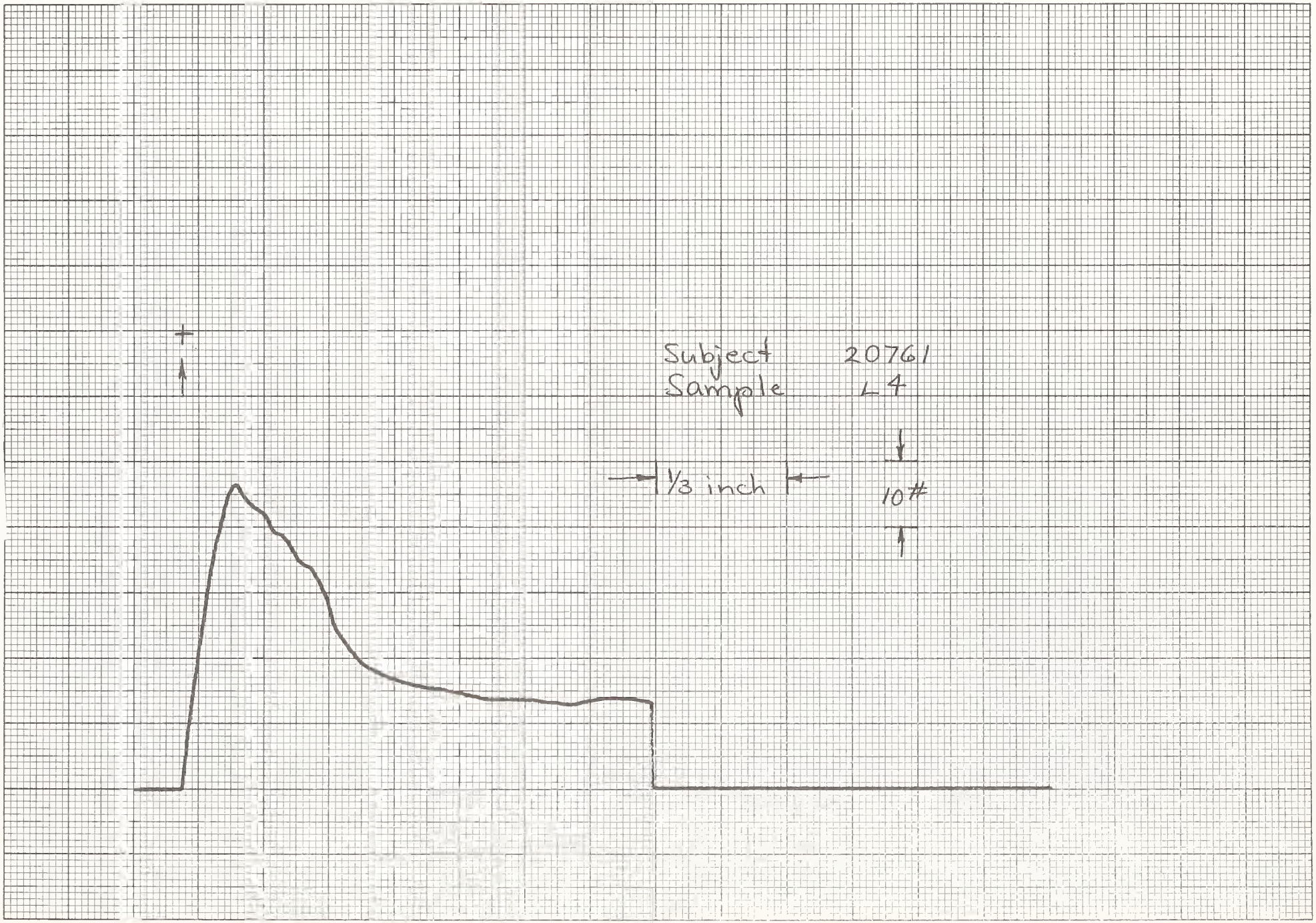
20629 L6
5 0 + h s


0.27
1.15
2.07
1.10
1.15
1.10
1.15
1.10
1.15

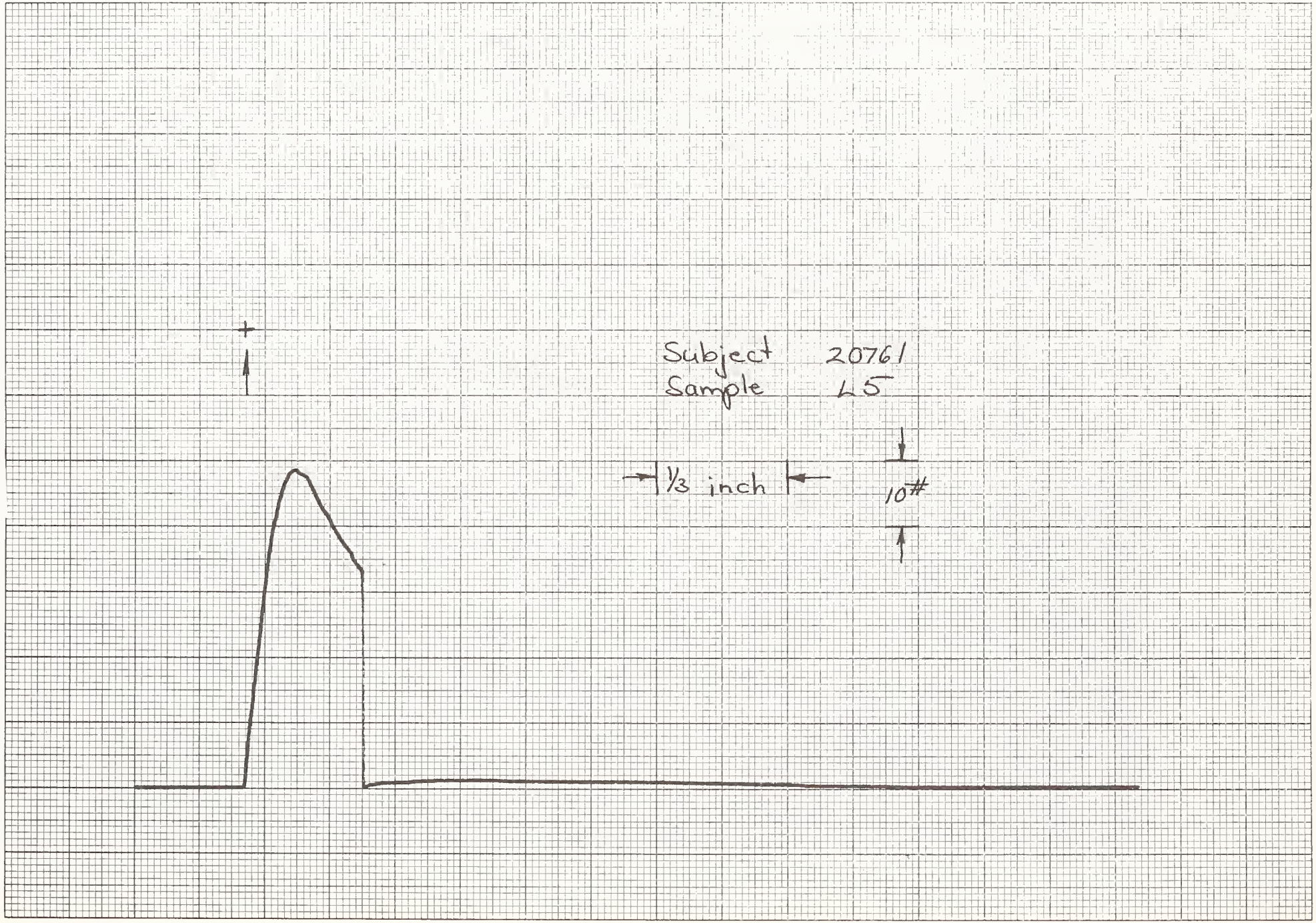
20629 L7
INCHES
1


Subject 20629
Sample L8
1/3 inch
10#

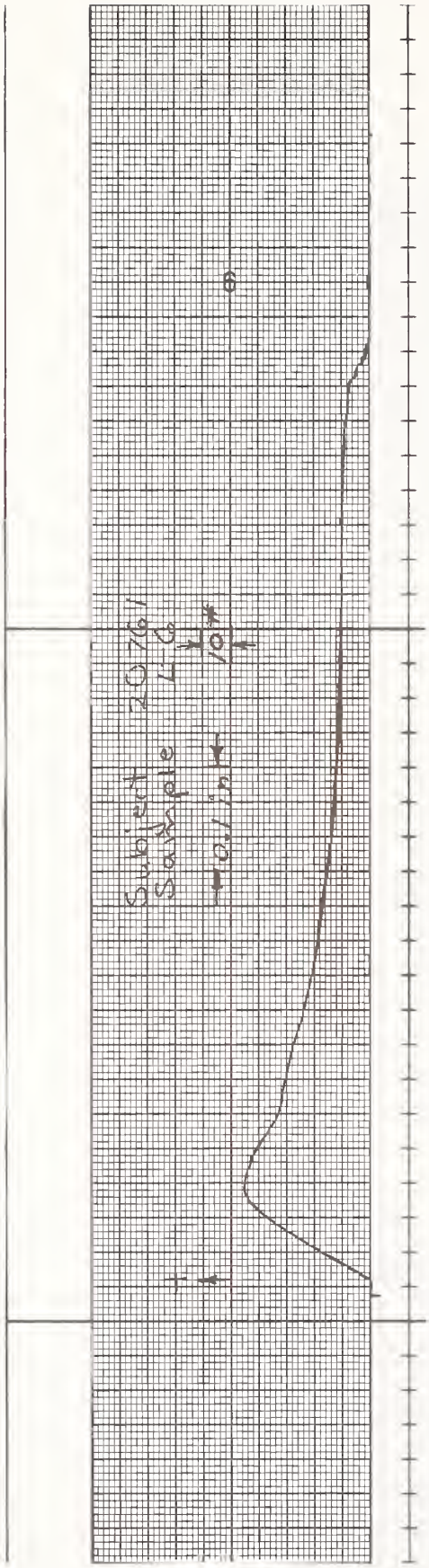
2062g L8
50ths


Subject 20761
Sample L4
1/3 inch
10#

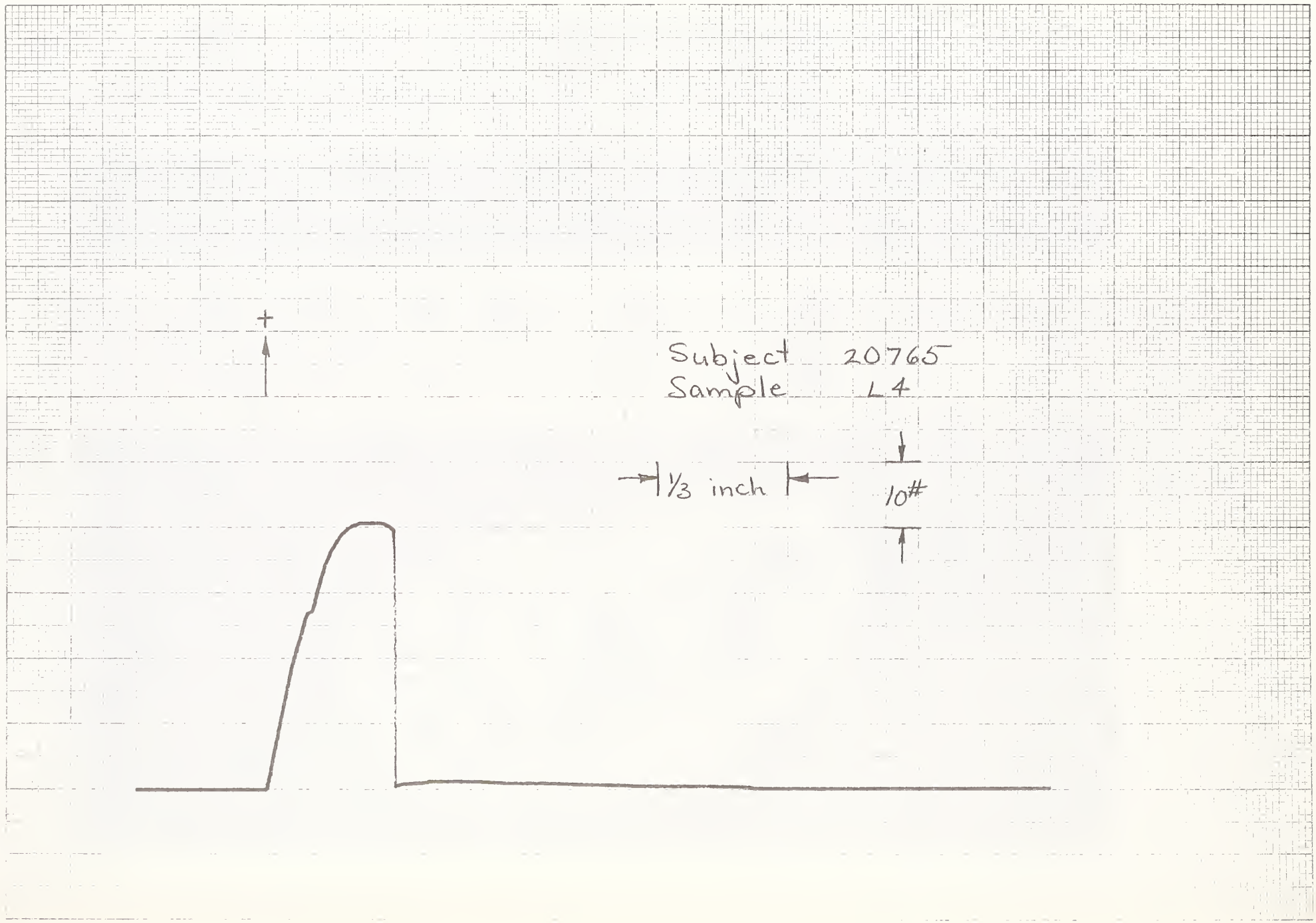
2076 L4
50ths


+
Subject 20761
Sample 45
1/3 inch
10#

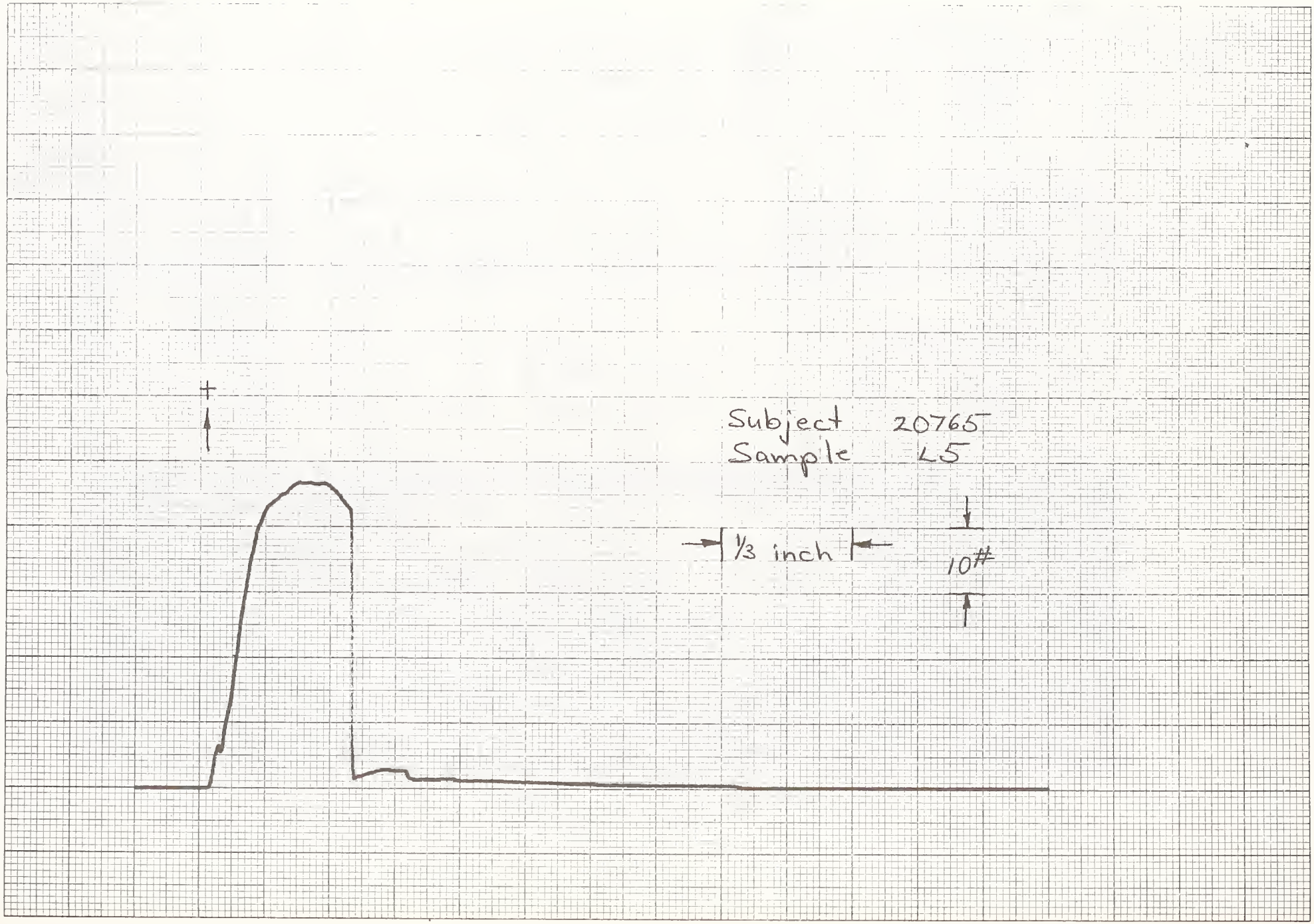
2076L5
5ntns


6
Sample Depth 2.0 - 2.5'
10
15
20

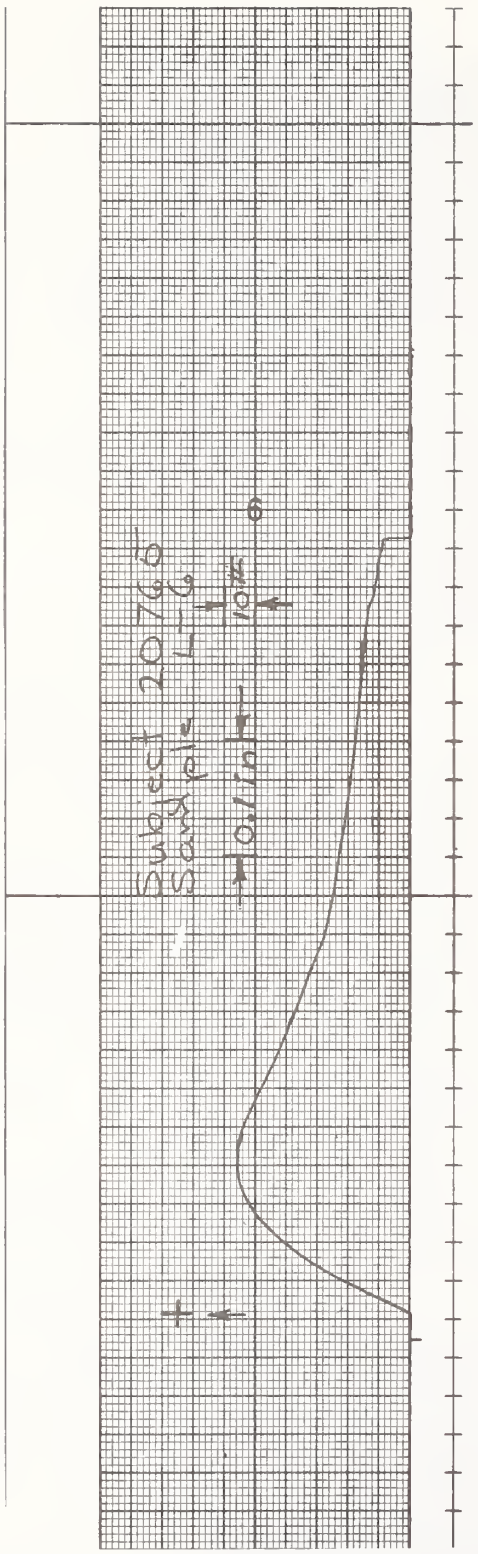
20761 L6


Subject 20765
Sample L4
⅓ inch
10#

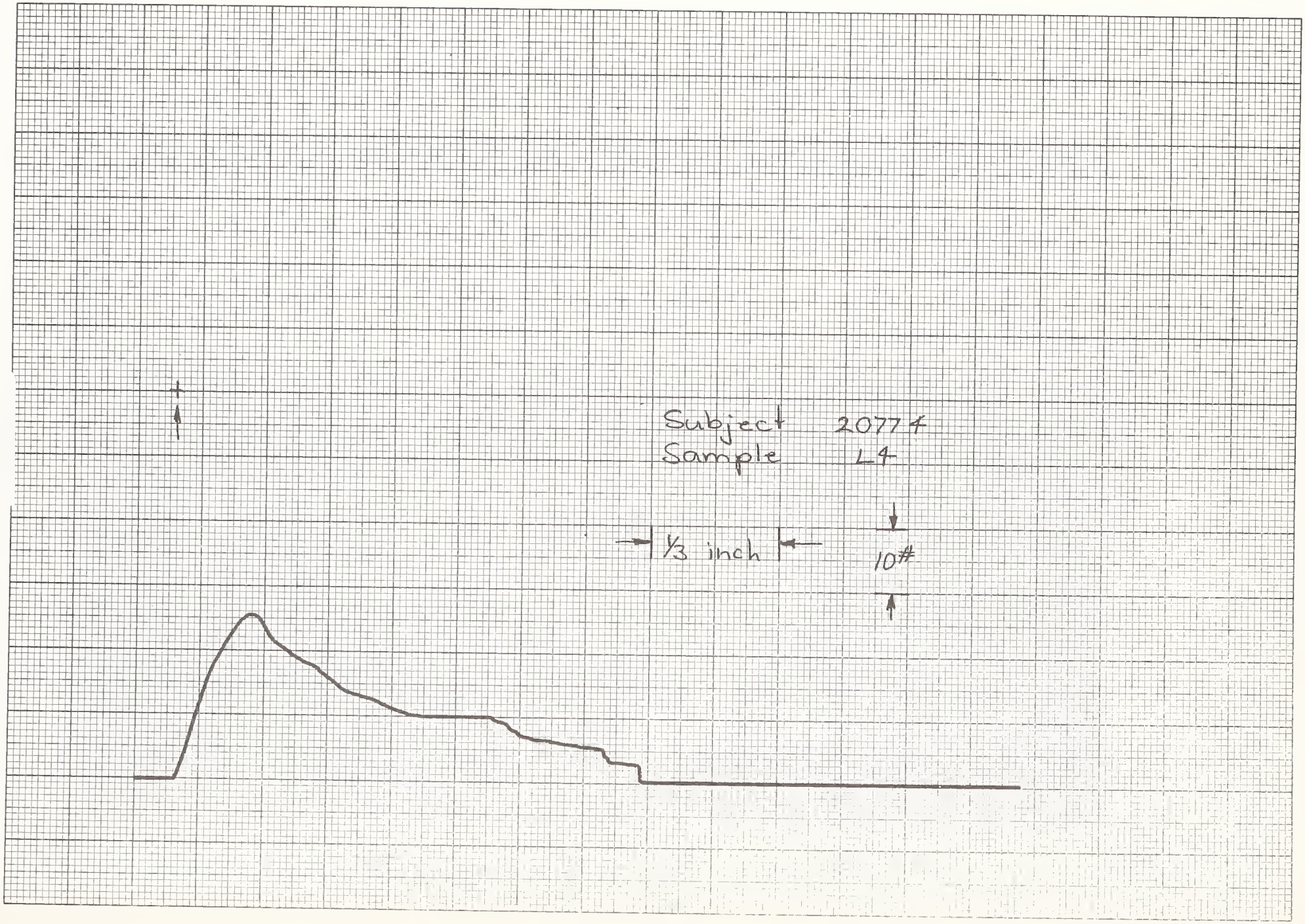
20765 L4
50ths


Subject 20765
Sample 45
⅓ inch
10#

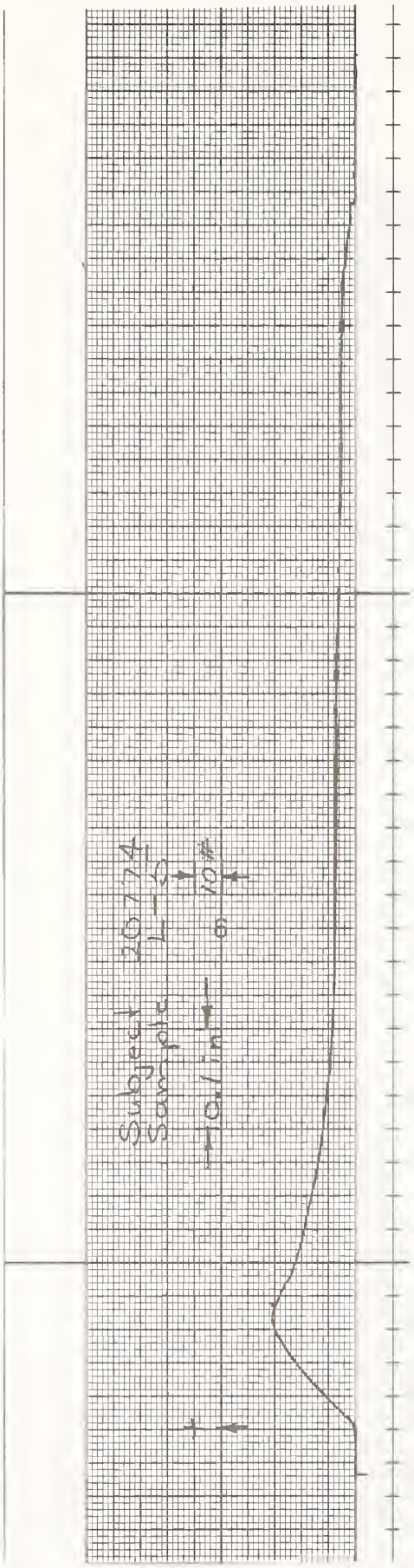
20765 L5
5 4 3 2

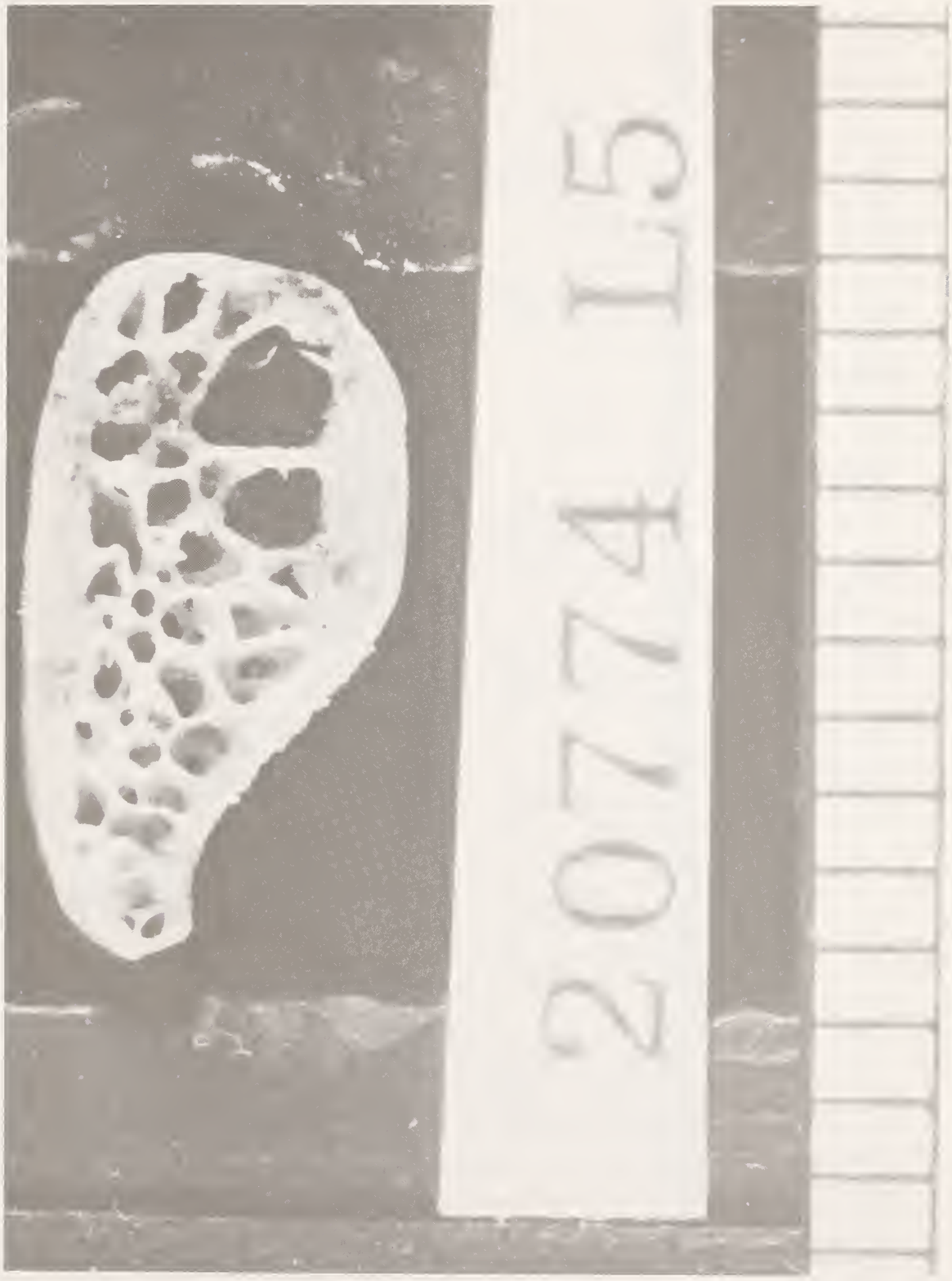

Subject 2076
Session 1
Trial 6
10 lbs.

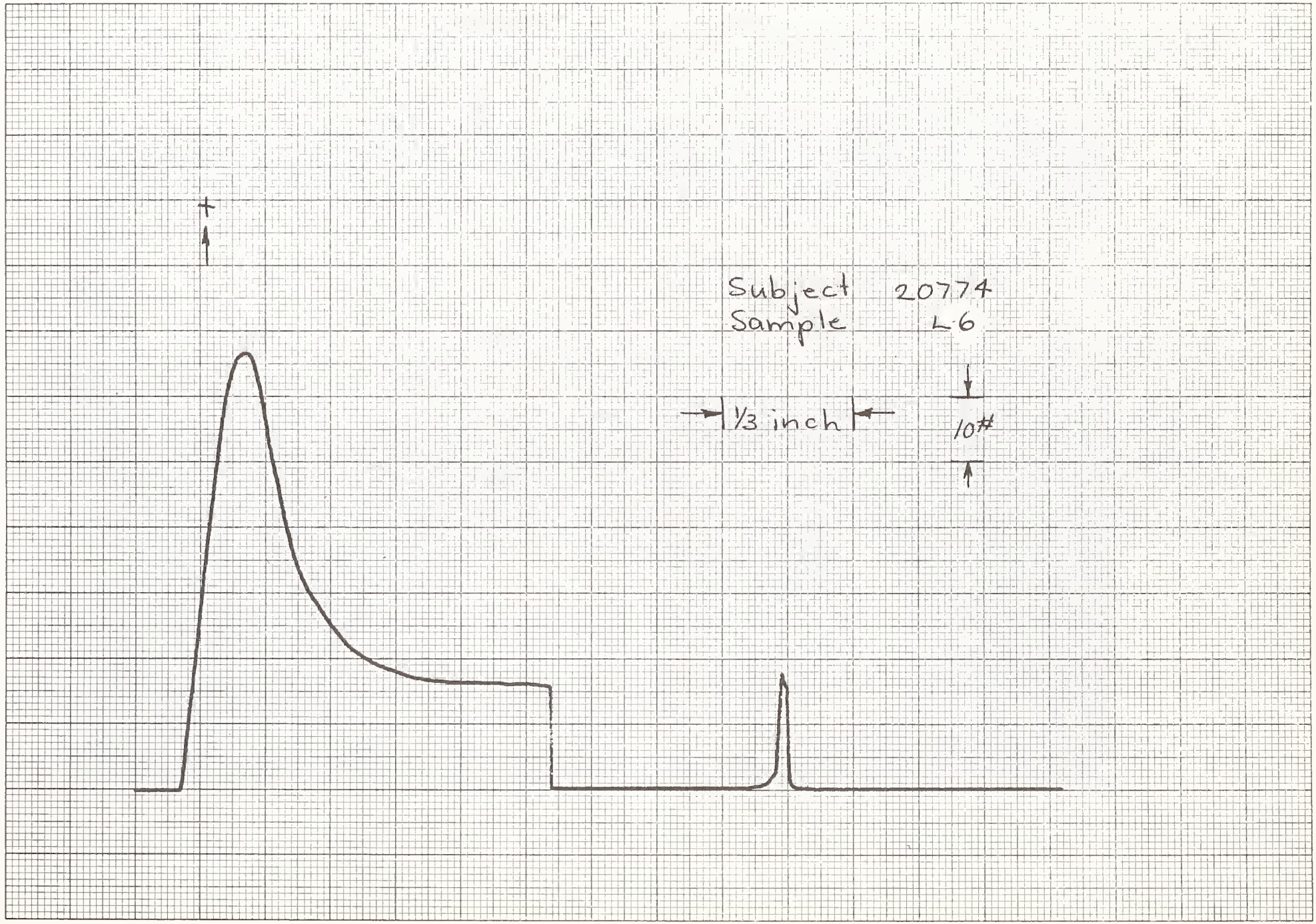
20765 L6


Subject
Sample
2077-4
L4
1/3 inch
10#

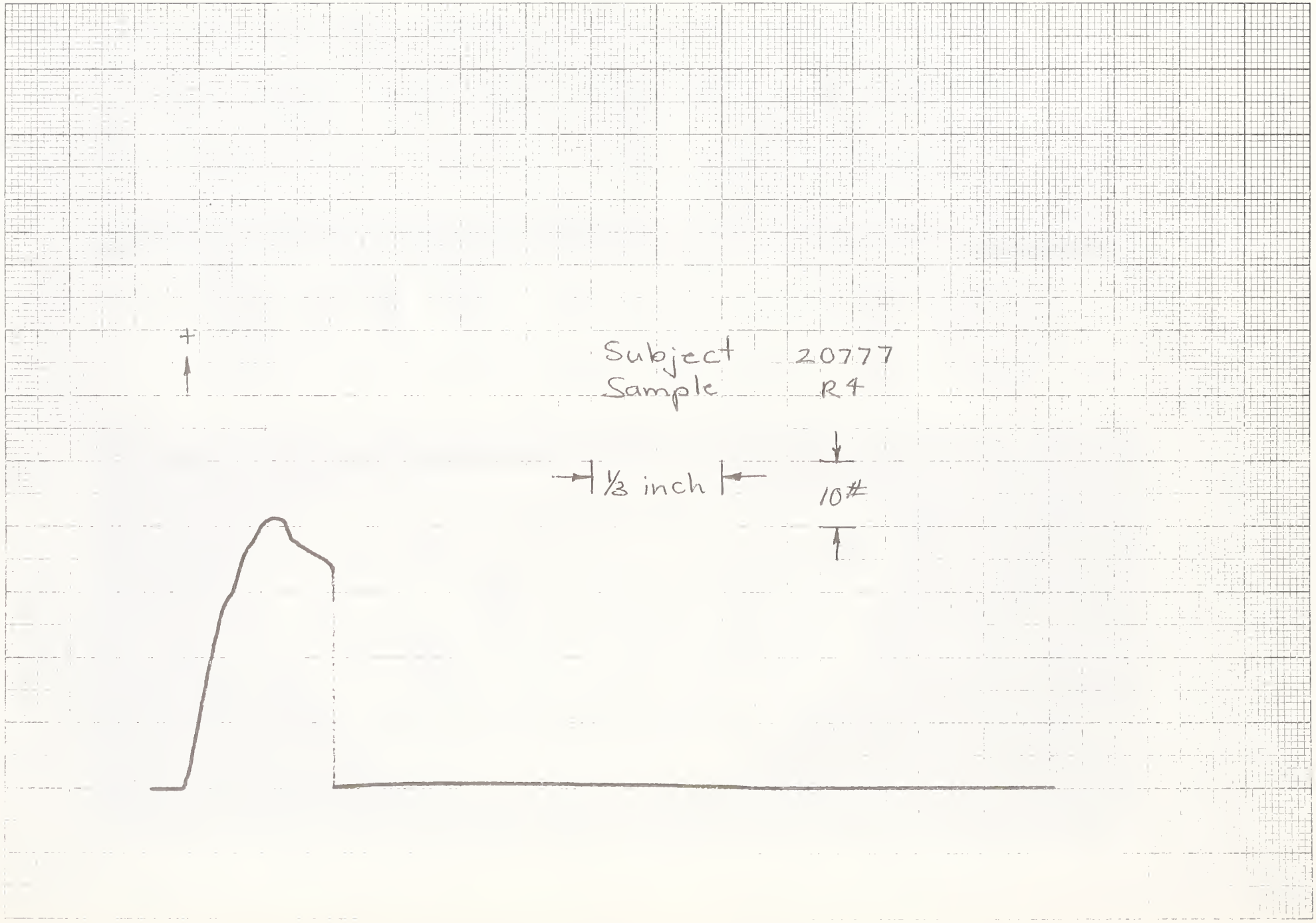
2074 L4
50ths


Subject
Sample
20774
1-C
20#
6
10.1 in

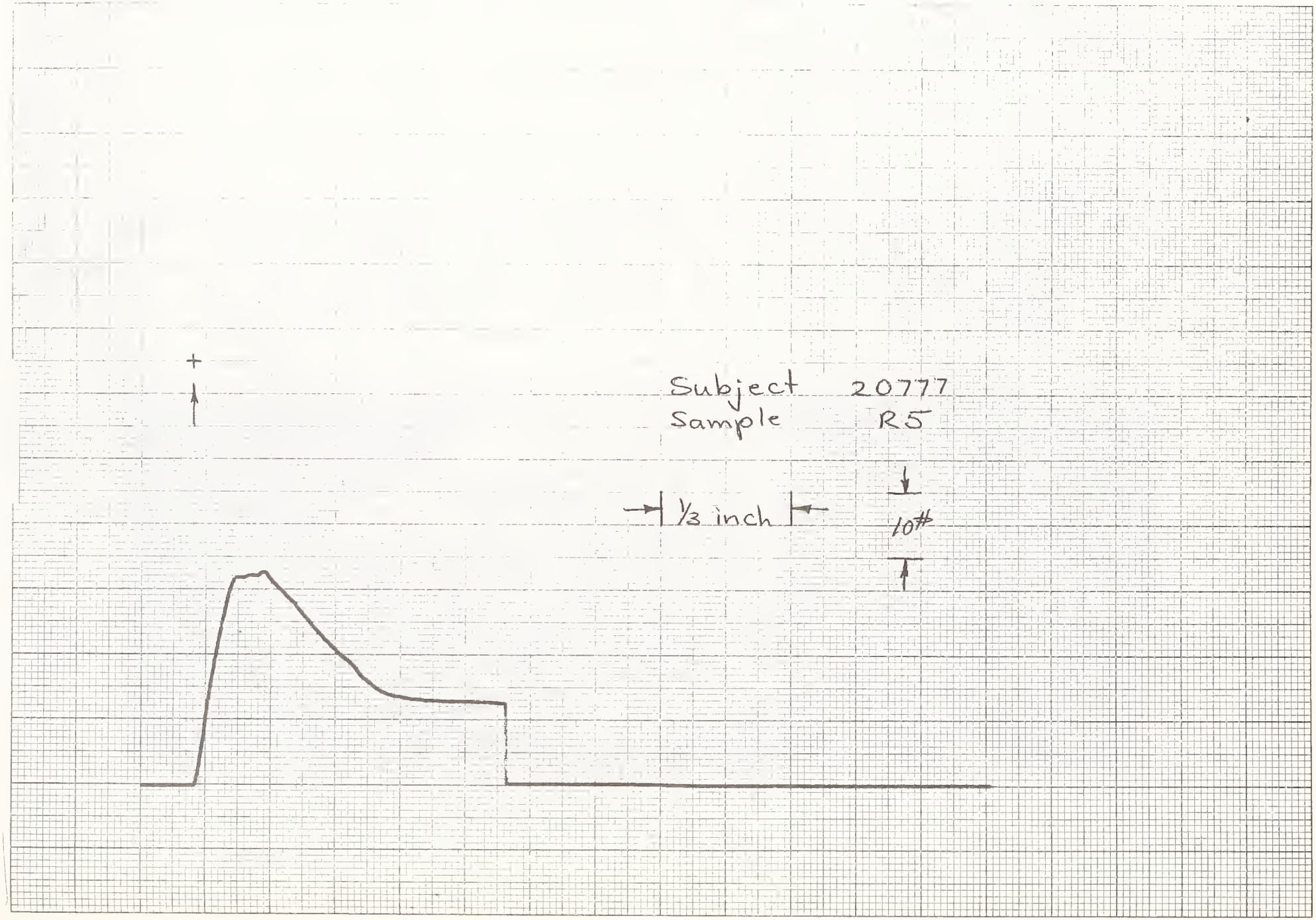

2074 L5


Subject 20774
Sample L-6
⅓ inch
10#

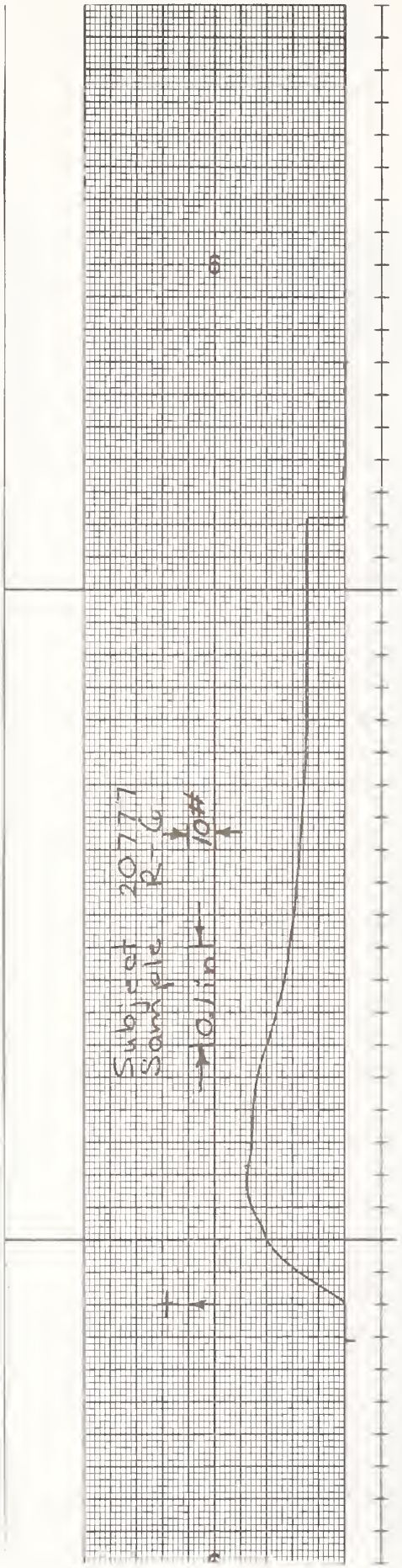
20774 16
5 inches


Subject 20777
Sample R4
⅓ inch
10#

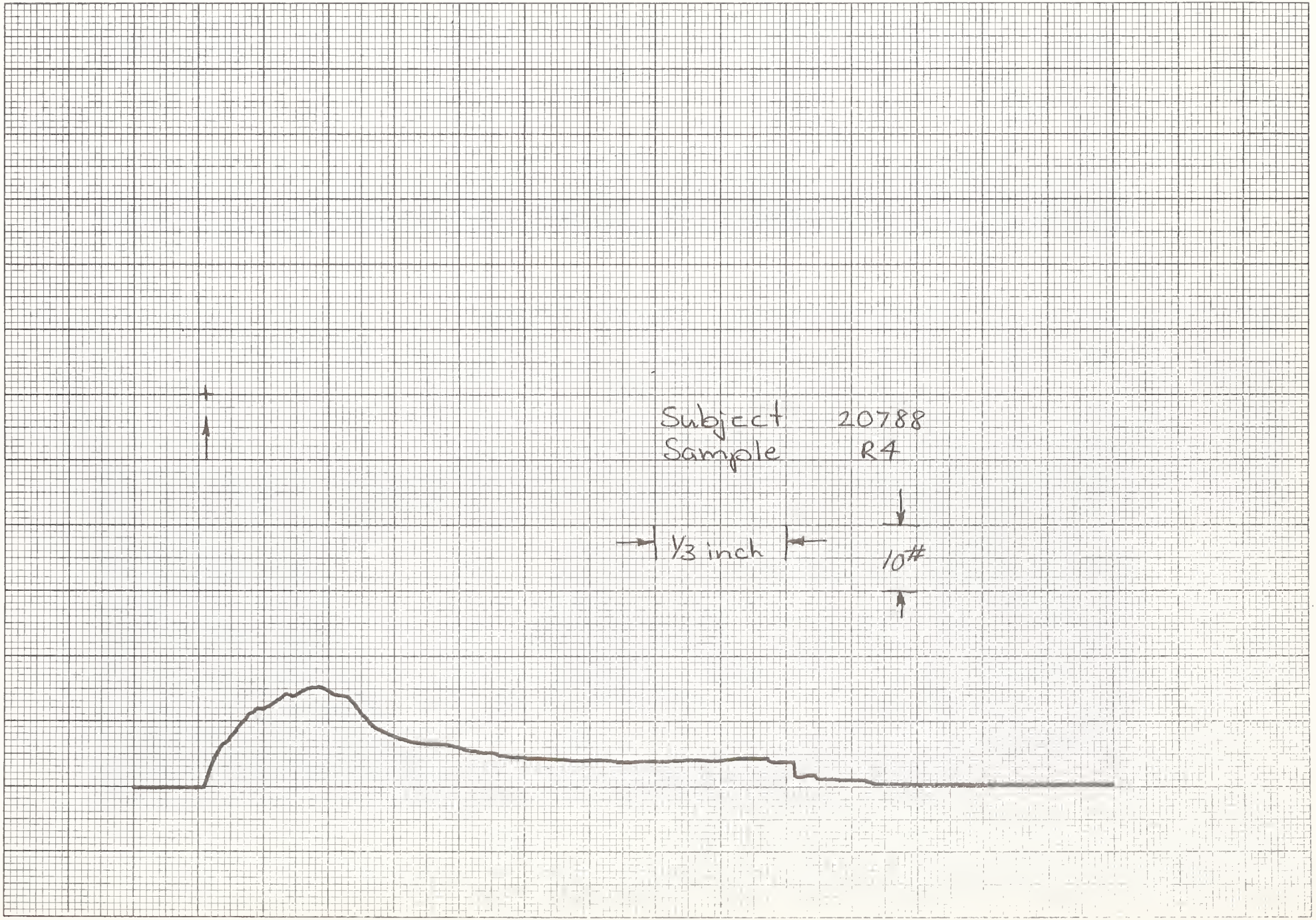
2077 R4
50ths


+
Subject 20777
Sample R5
⅓ inch
10#

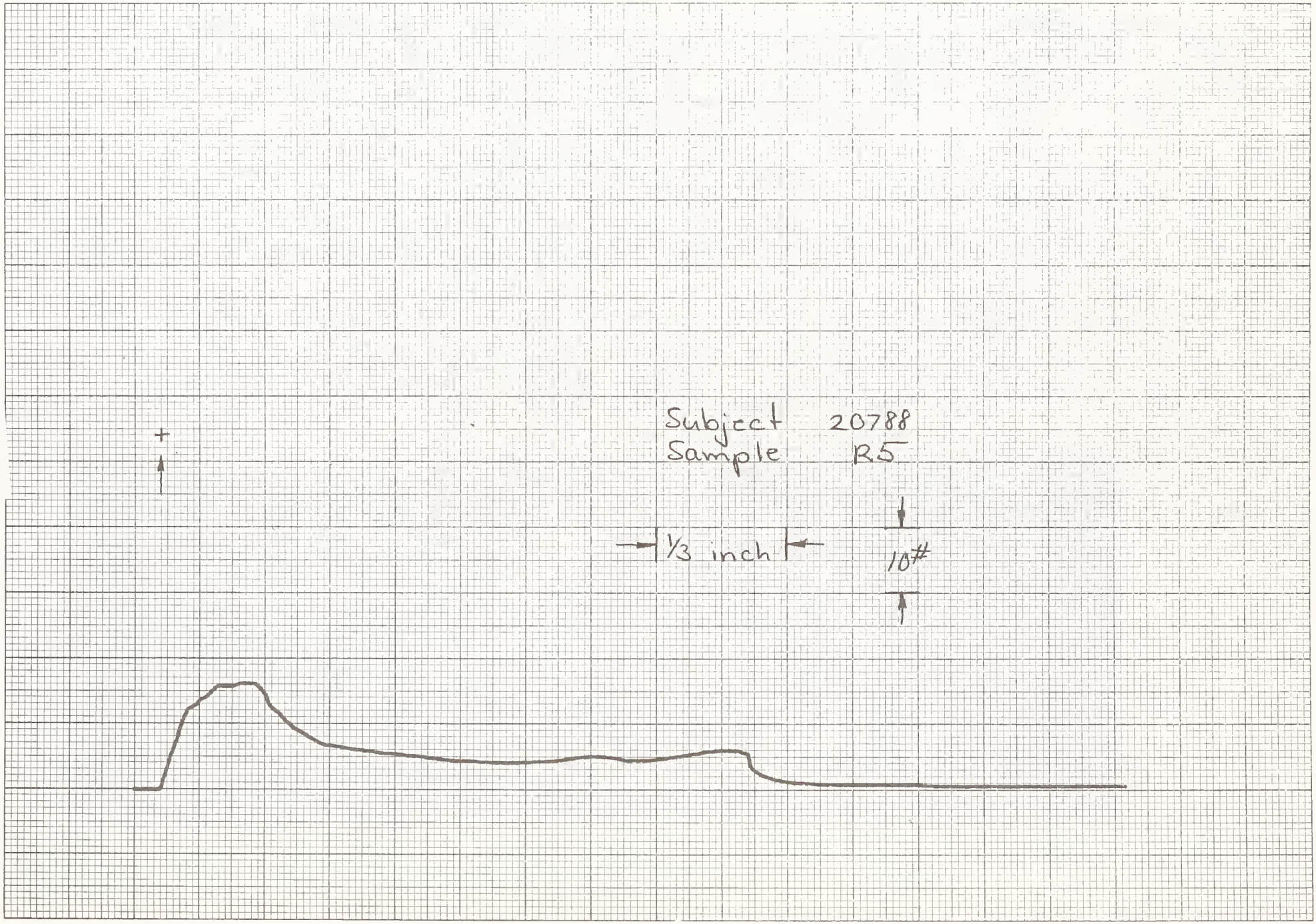
2077 R5
50ths


6
#01
2077
Pipe
Sensor
Pipe
Sensor

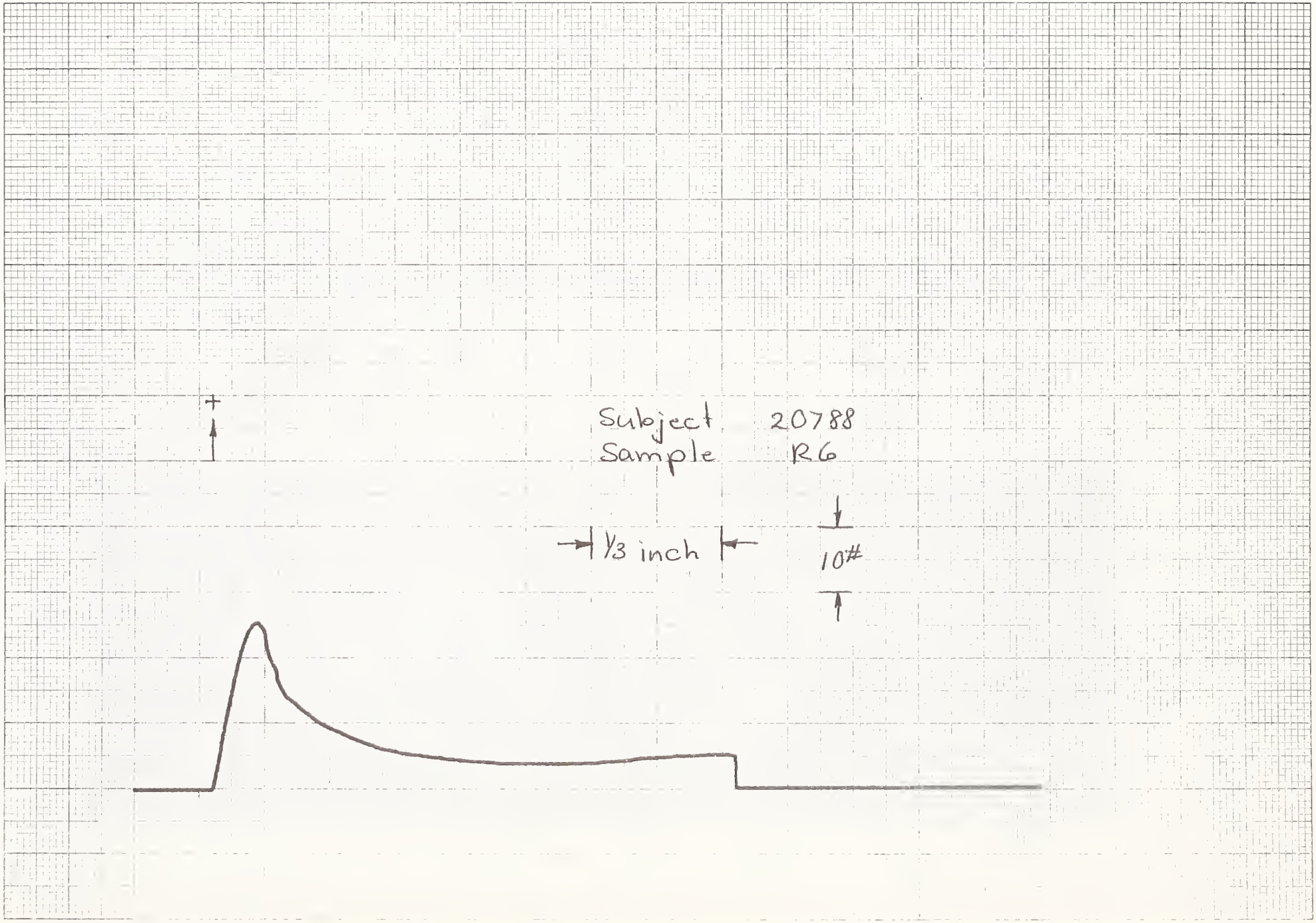
20777 R6
1
INCHES


Subject
Sample
20788
R4
1/3 inch
10#

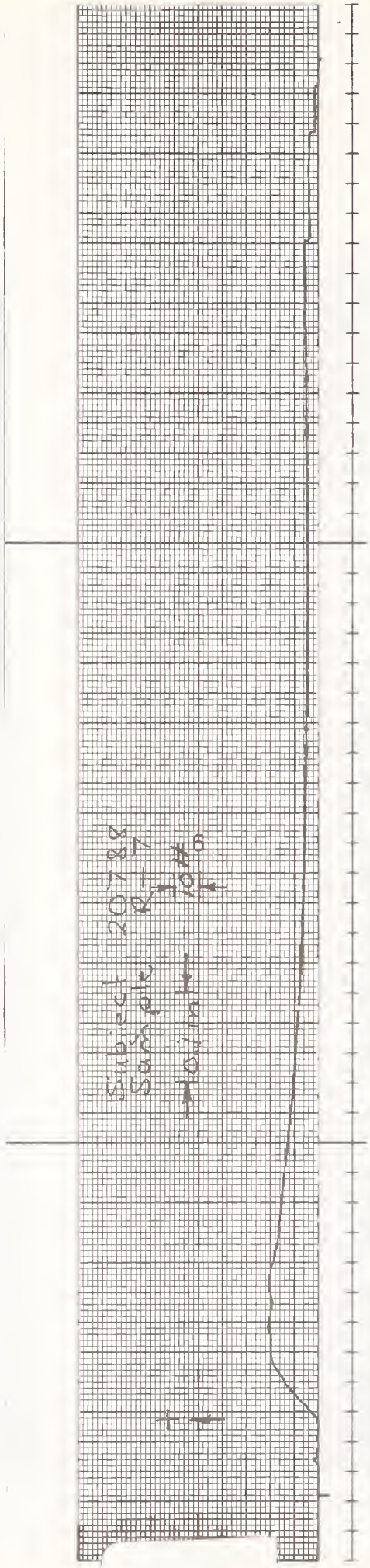
20788 R4
50ths

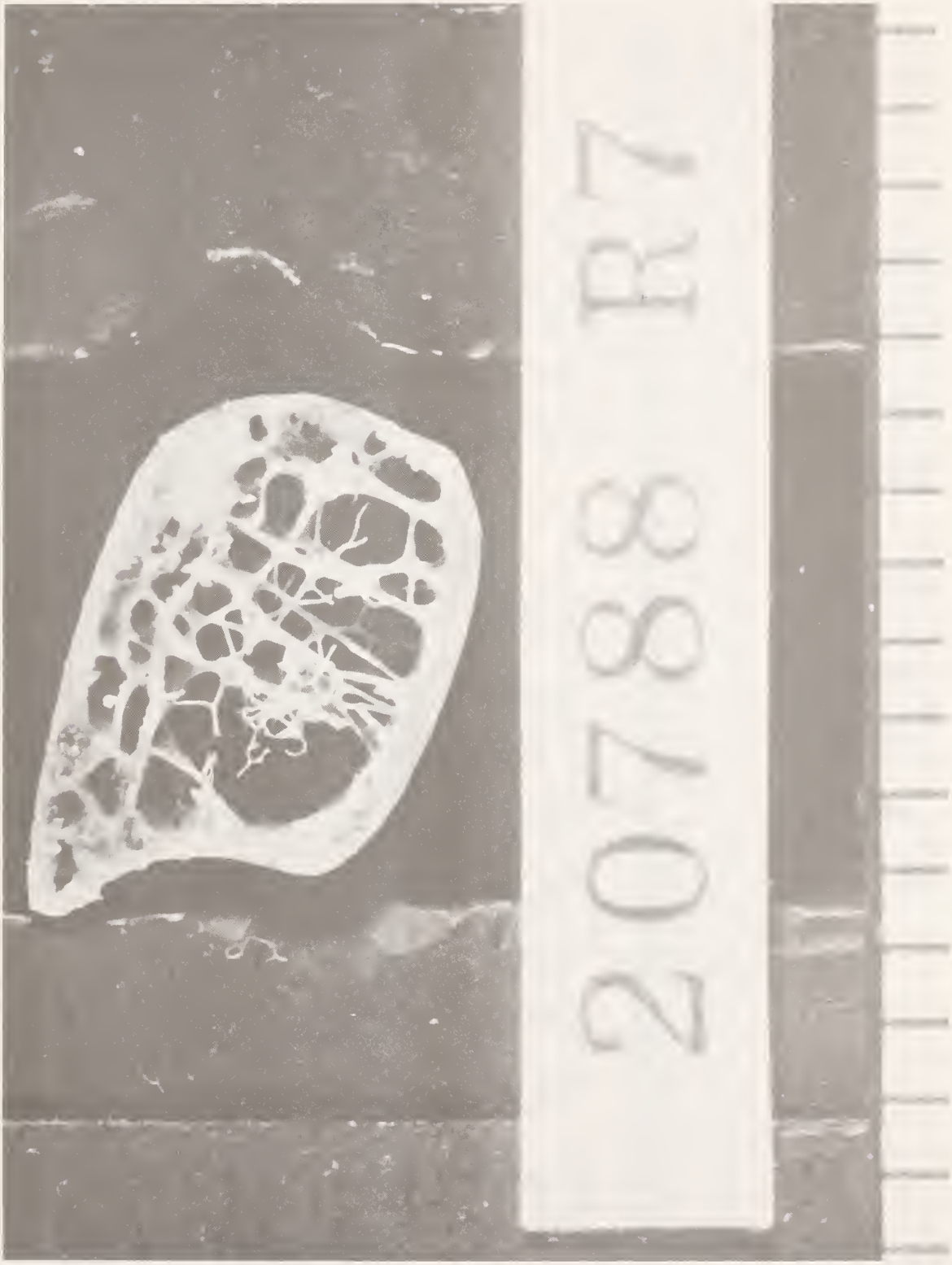

+
Subject 20788
Sample R5
⅓ inch
10#

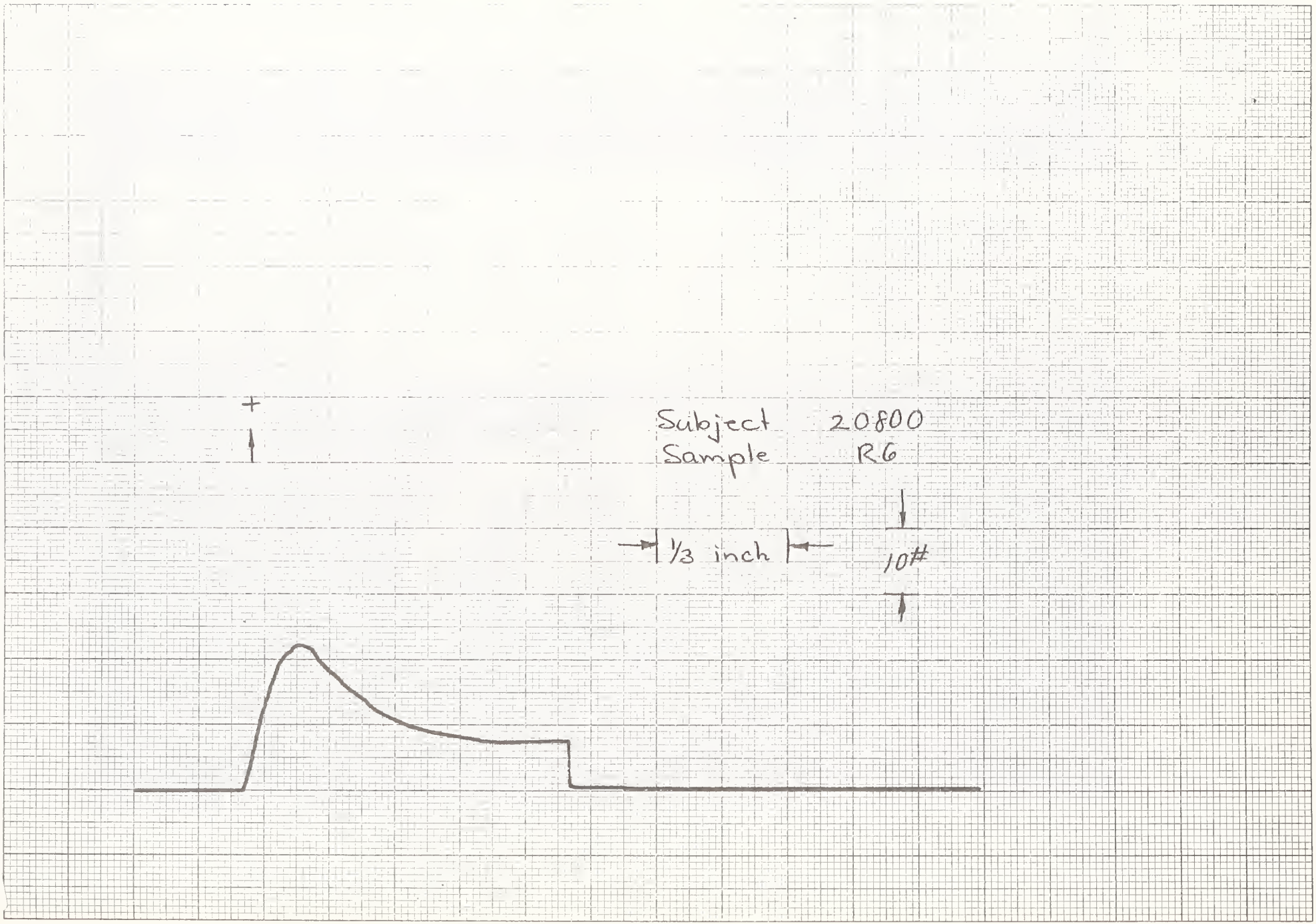
20788 R5
50ths


Subject 20788
Sample R6
1/3 inch
10#

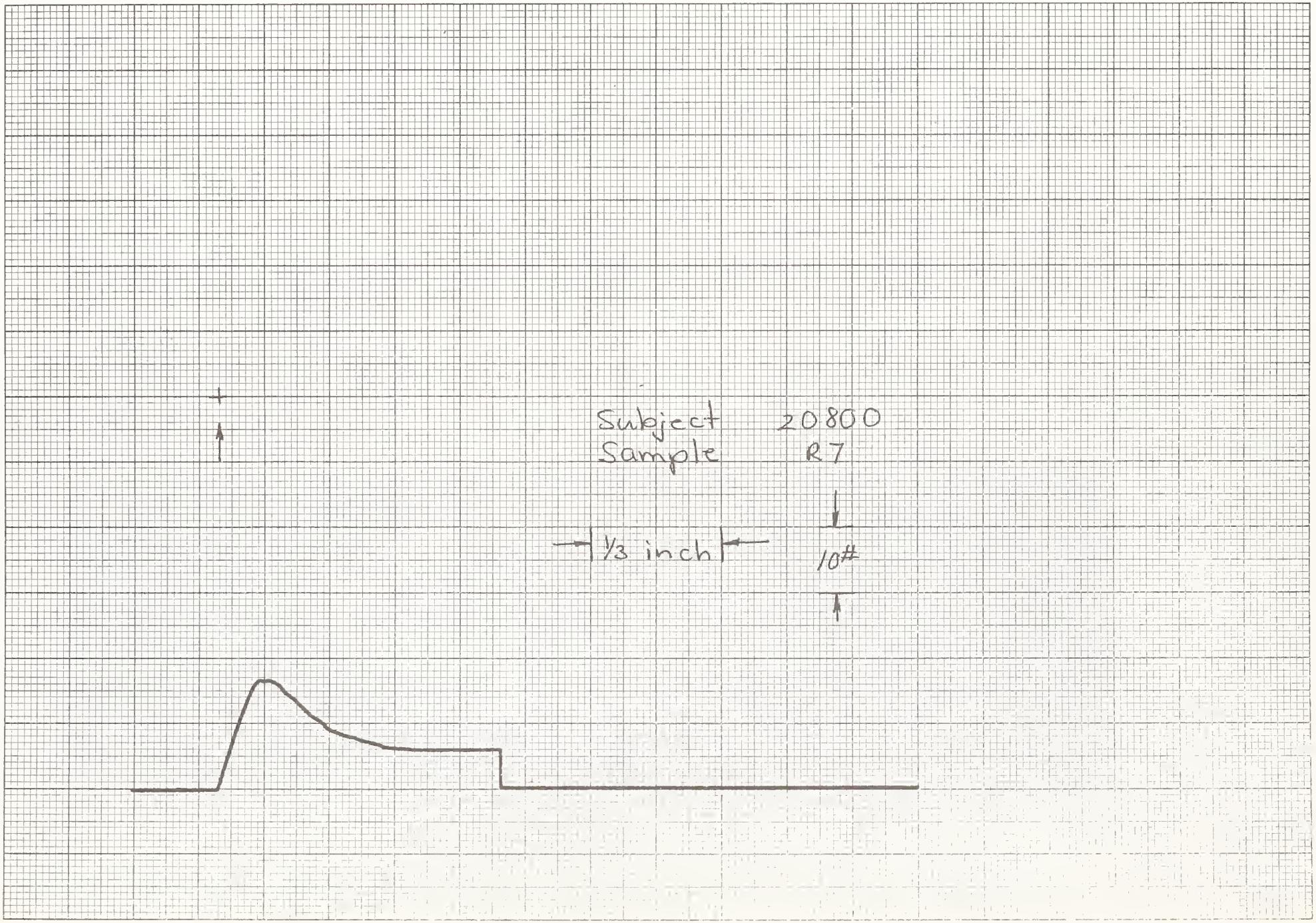
20788 R6
South



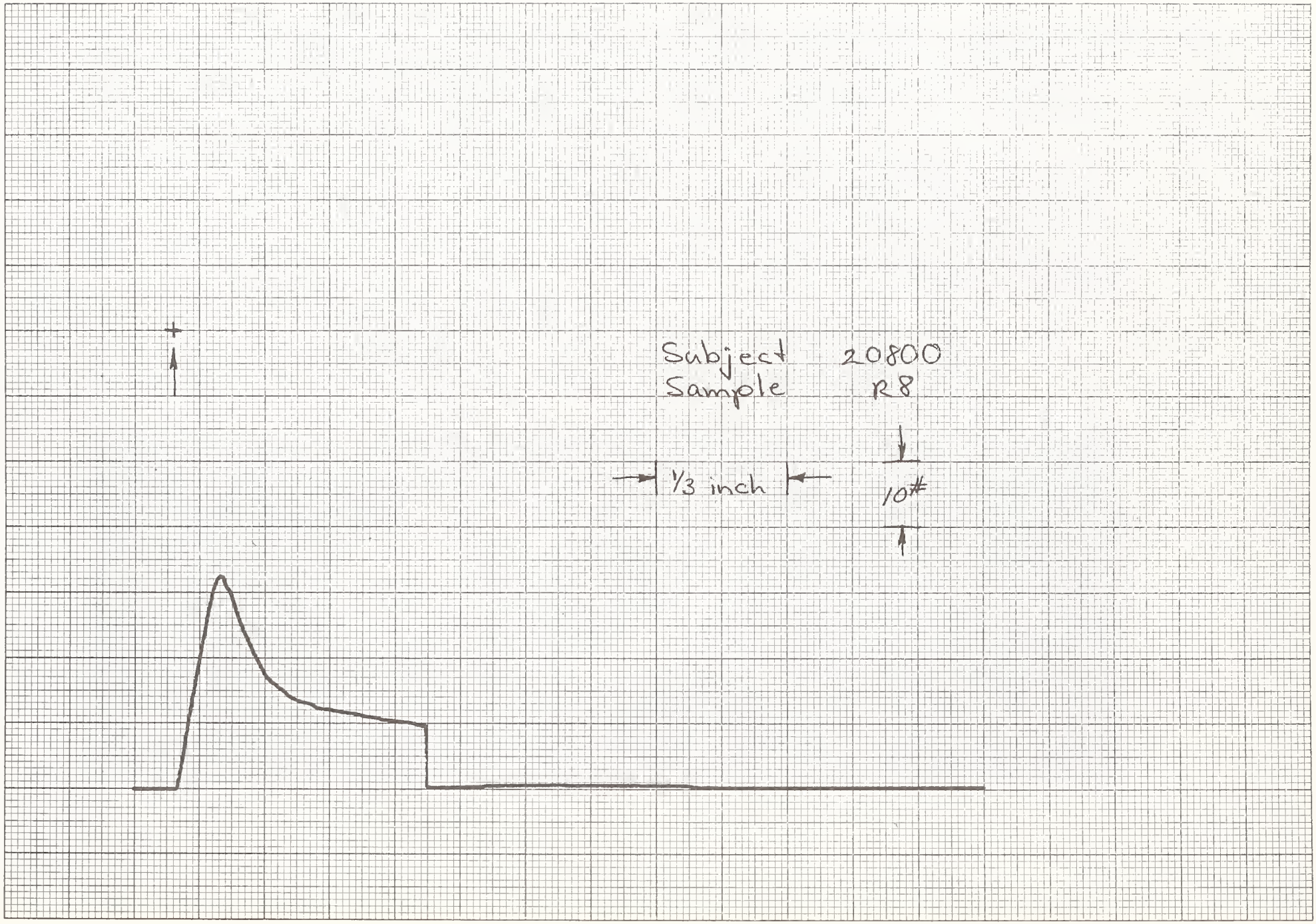

2078 R7


+
Subject Sample
20800 R6
⅓ inch
10#

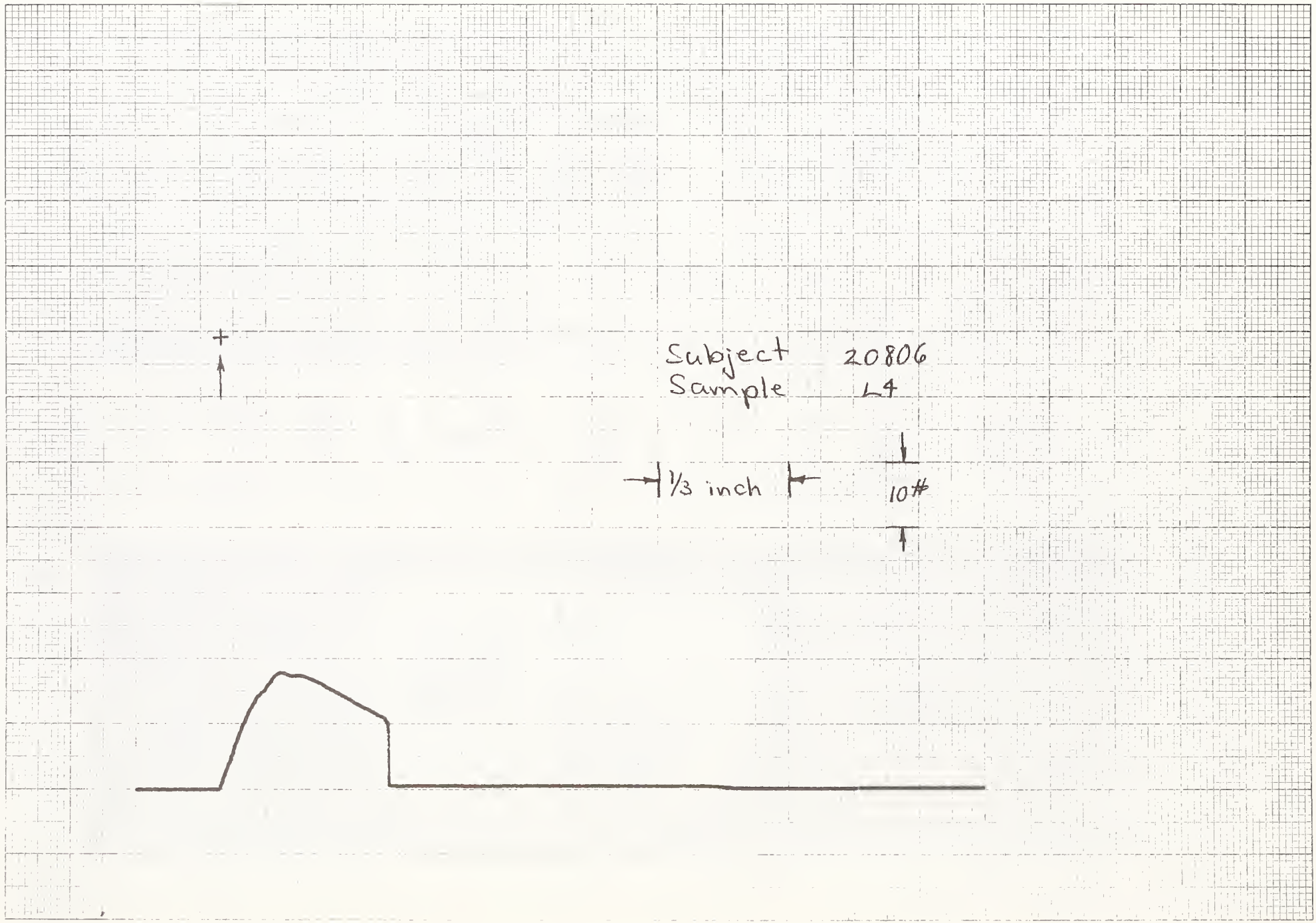
2080 R6
50ths


Subject
Sample
20800
R7
1/3 inch
10#

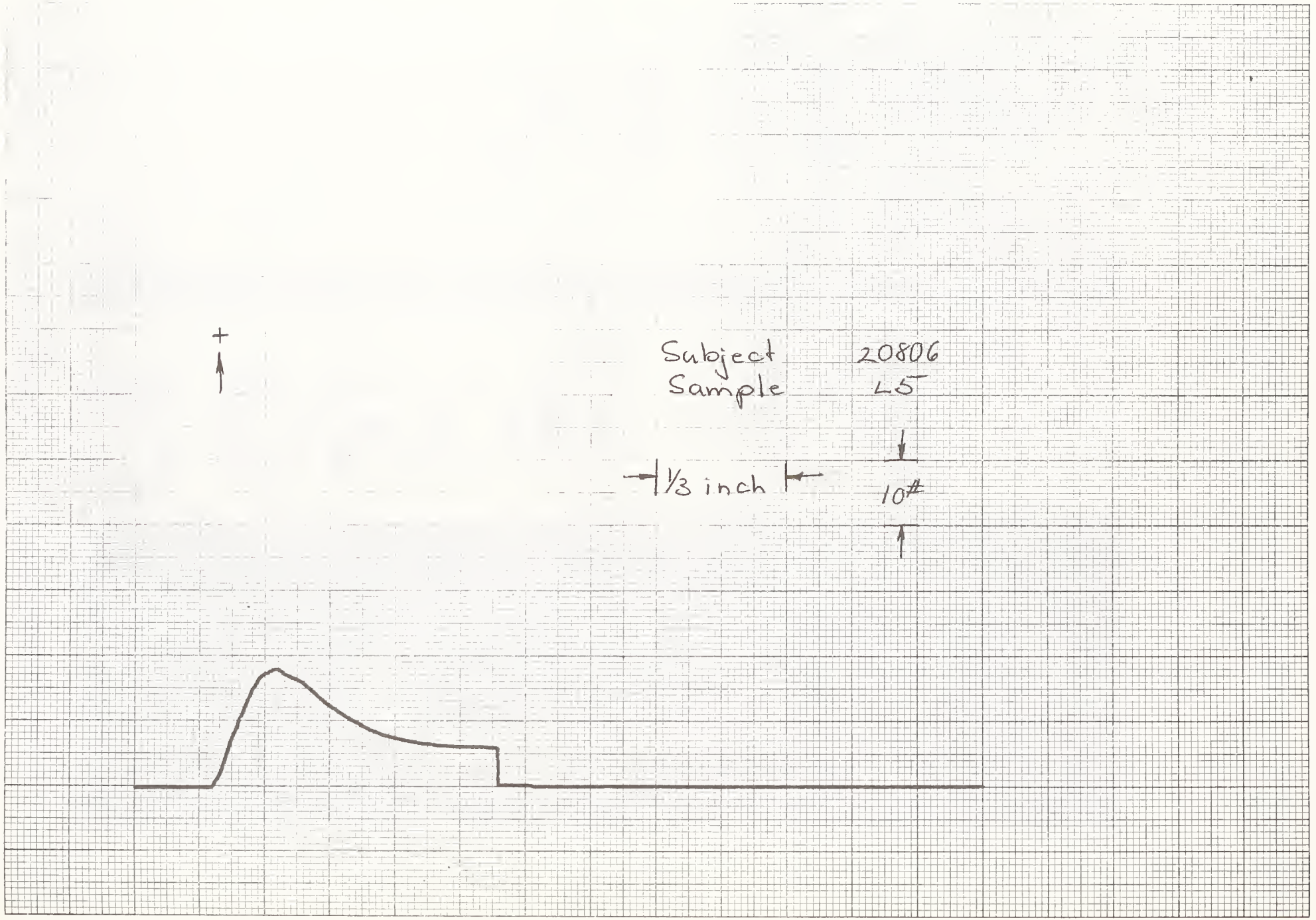
20800 R7
50ths


Subject
Sample
20800
R8
1/3 inch
10#

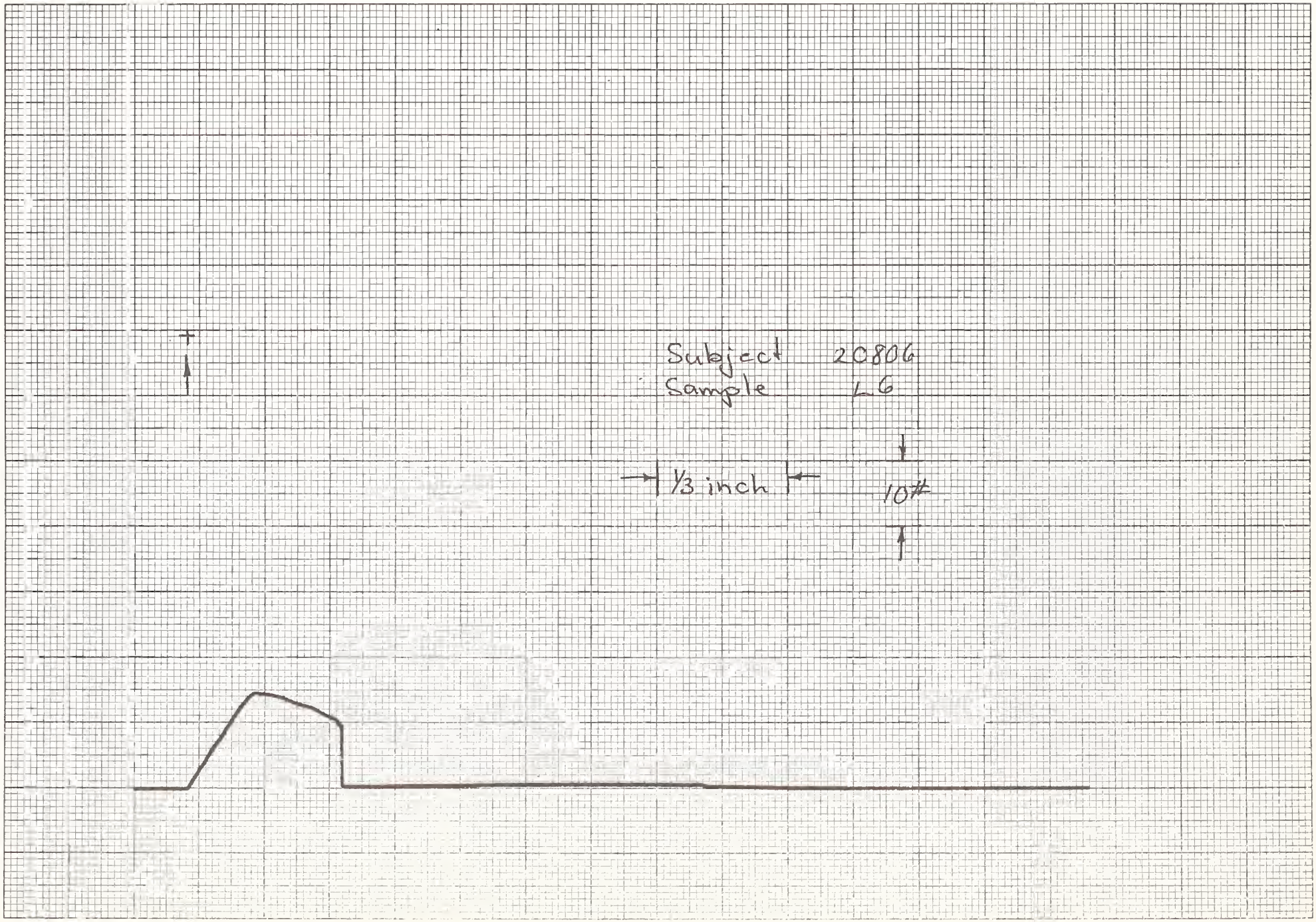
20800 R8
50ths


Subject
Sample
20806
L4
1/3 inch
10#

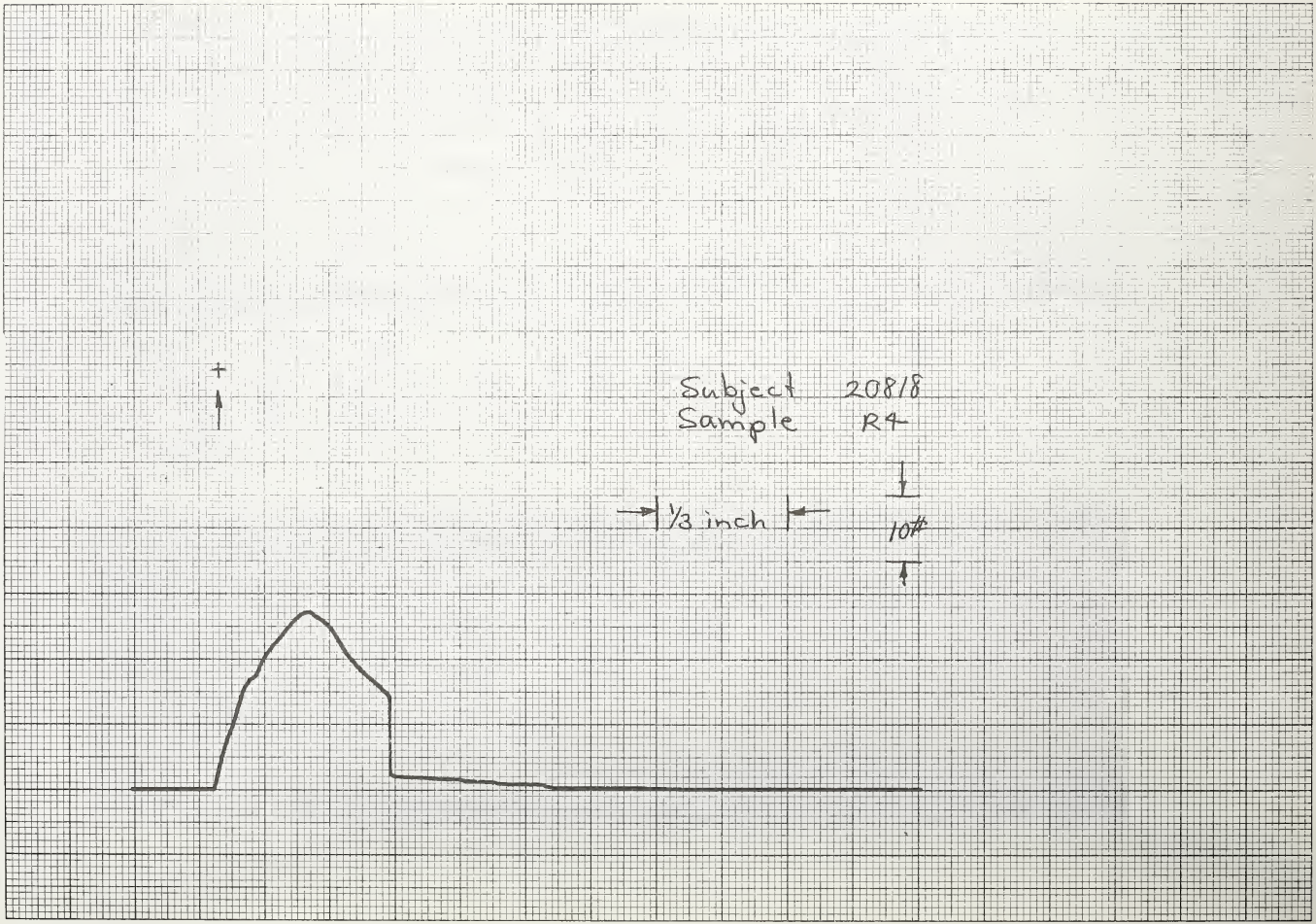
20806 L4
50ths

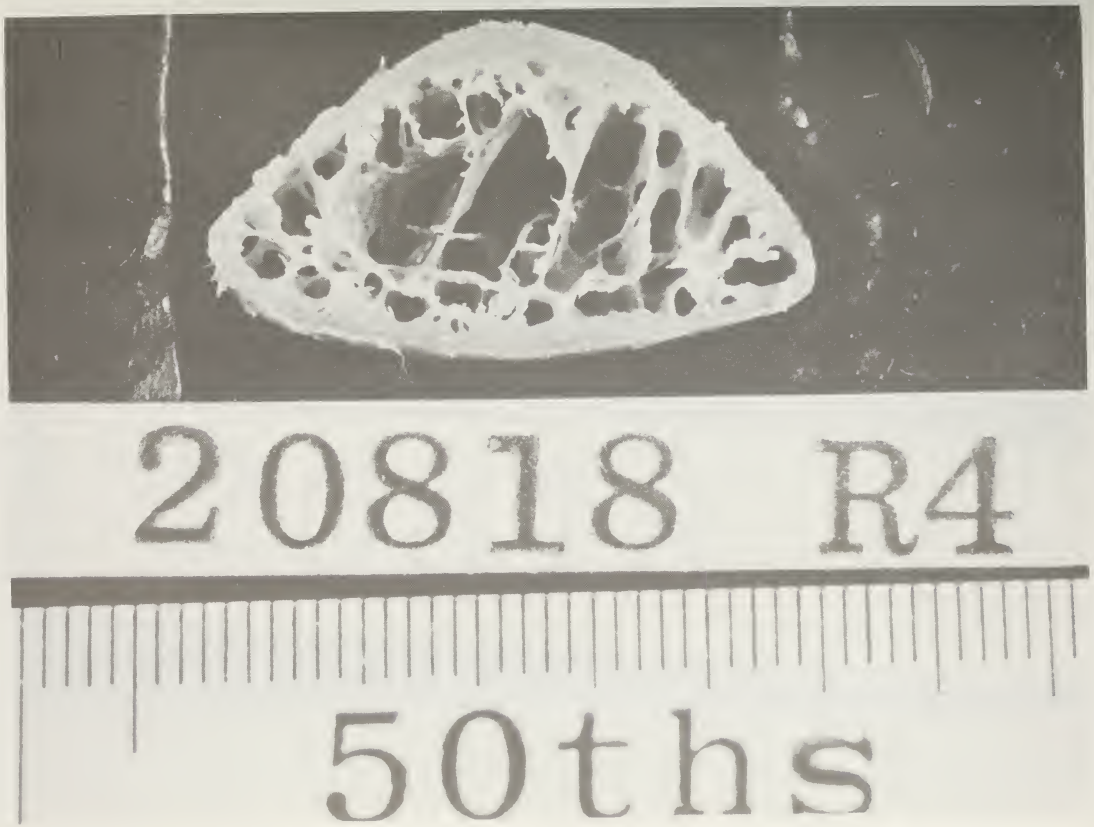

Subject
Sample
20806
45
1/3 inch
10#

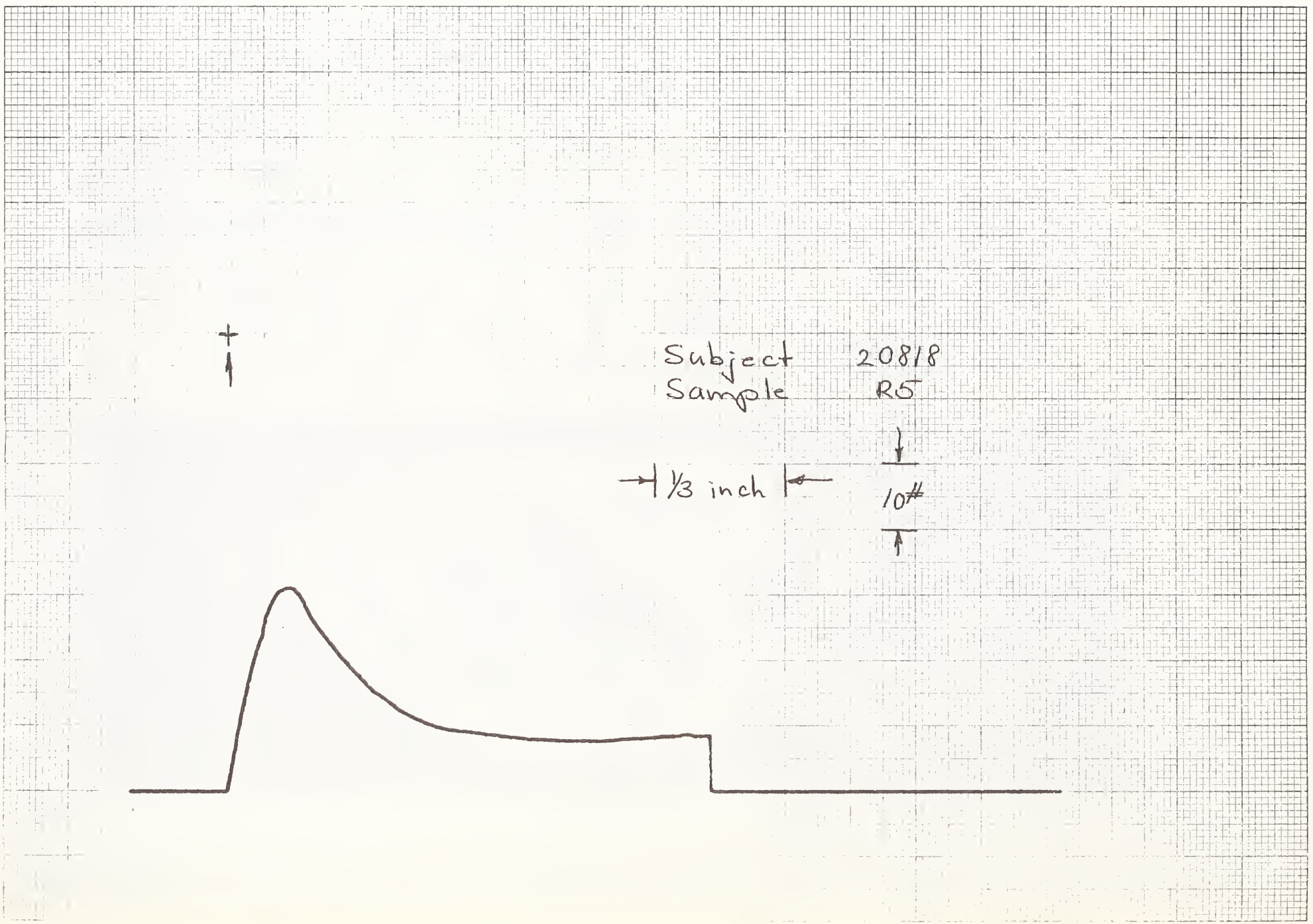
20806 L5
50ths


Subject 20806
Sample L6
⅓ inch
10#

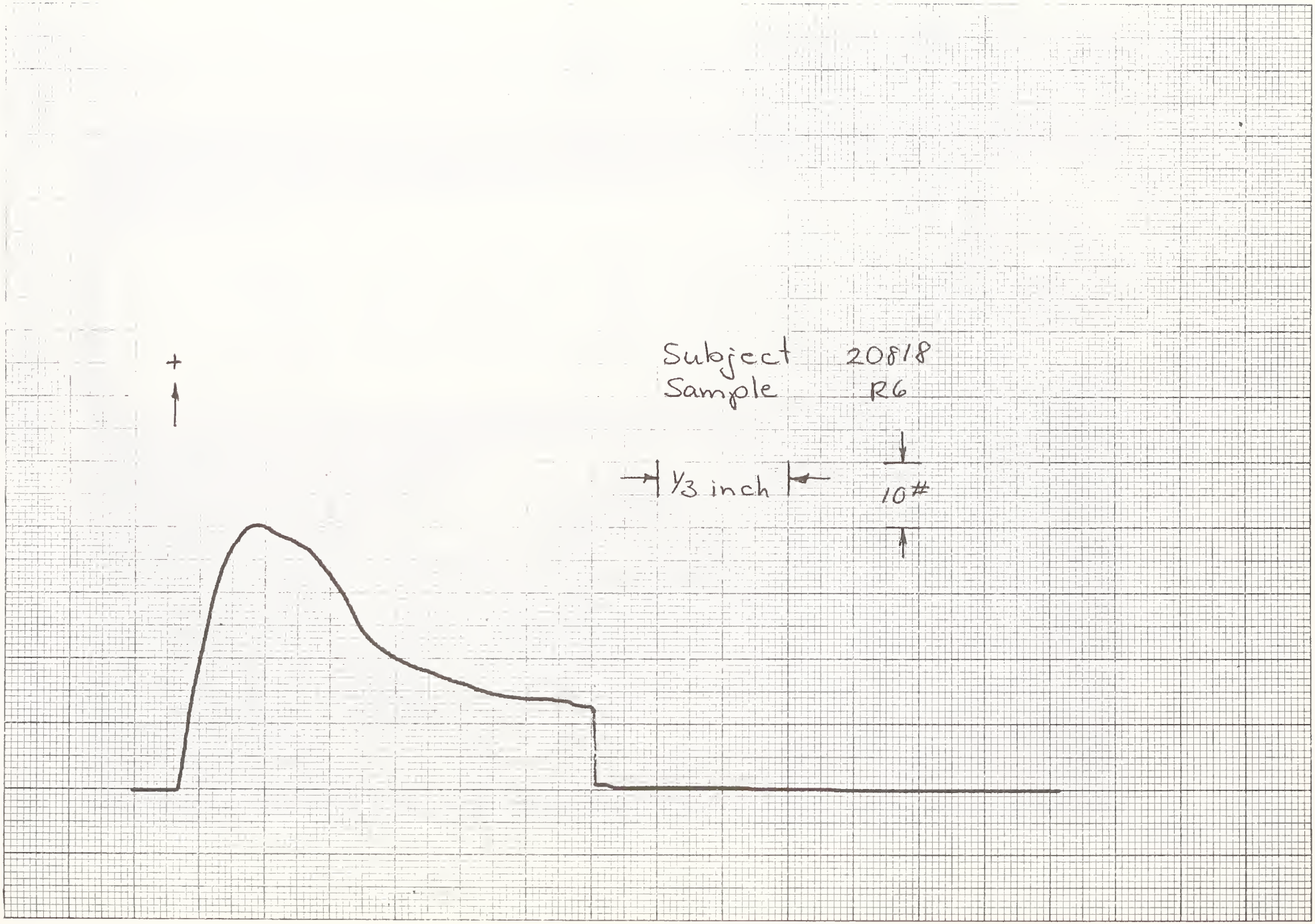
20806 L6
50ths


+
Subject 20818
Sample R4
1/3 inch
10#

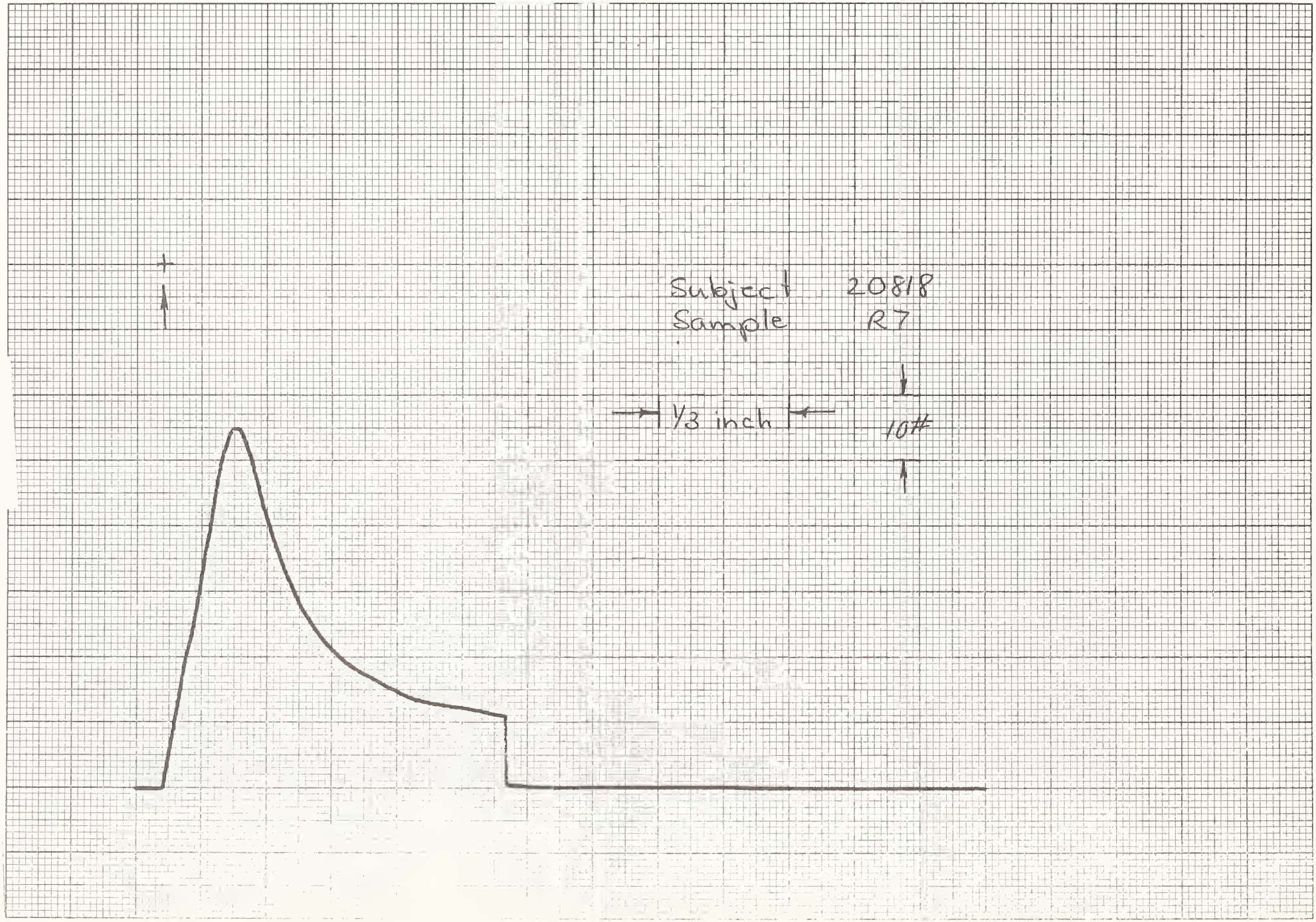

20818 R4
50ths


Subject 20818
Sample R5
⅓ inch
10#

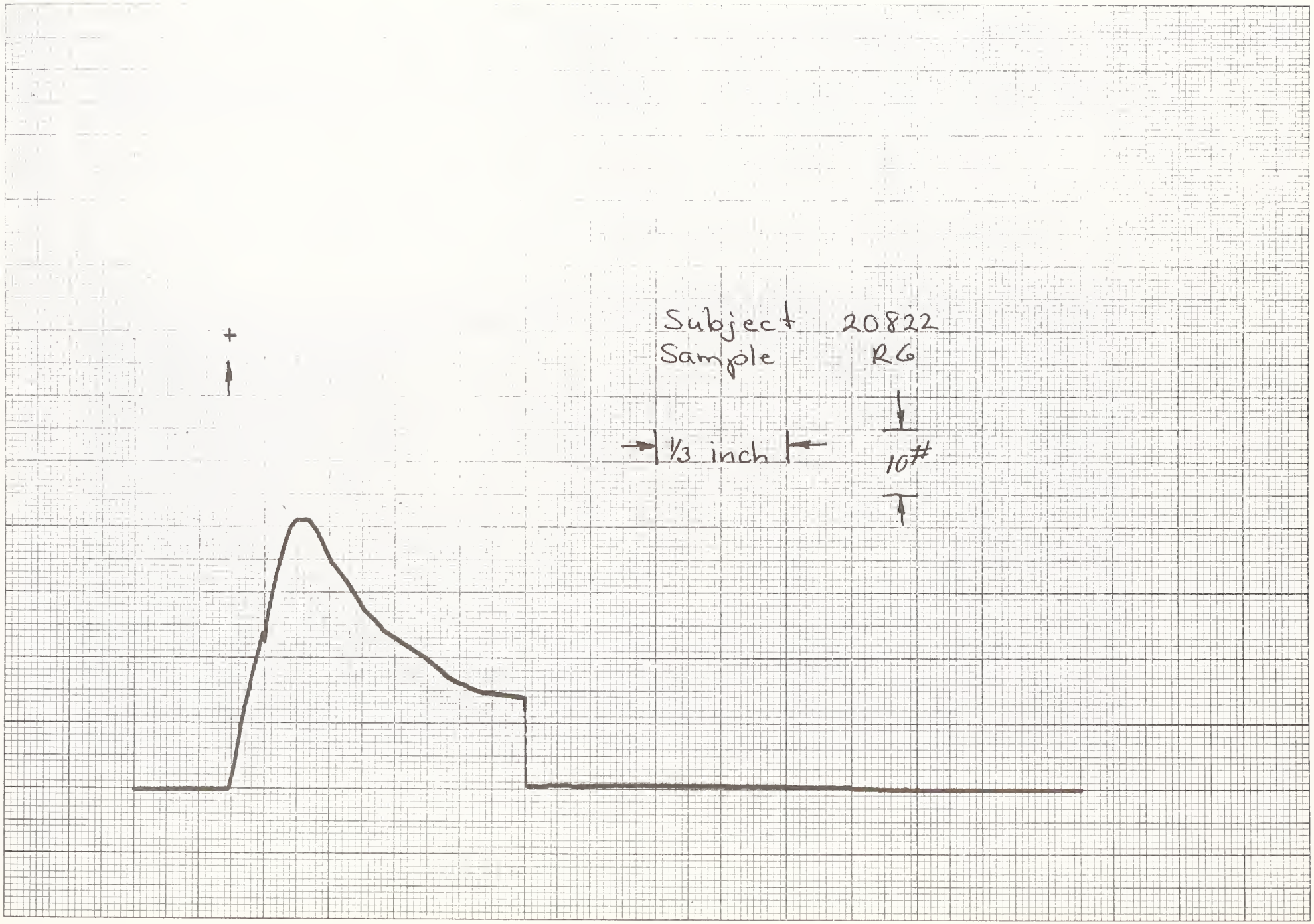
20818 R5


+
Subject 20818
Sample R6
1/3 inch
10#

20818 R6


Subject 20818
Sample R7
1/3 inch
10#

20818 R7


+
Subject 20822
Sample R6
⅓ inch
10#

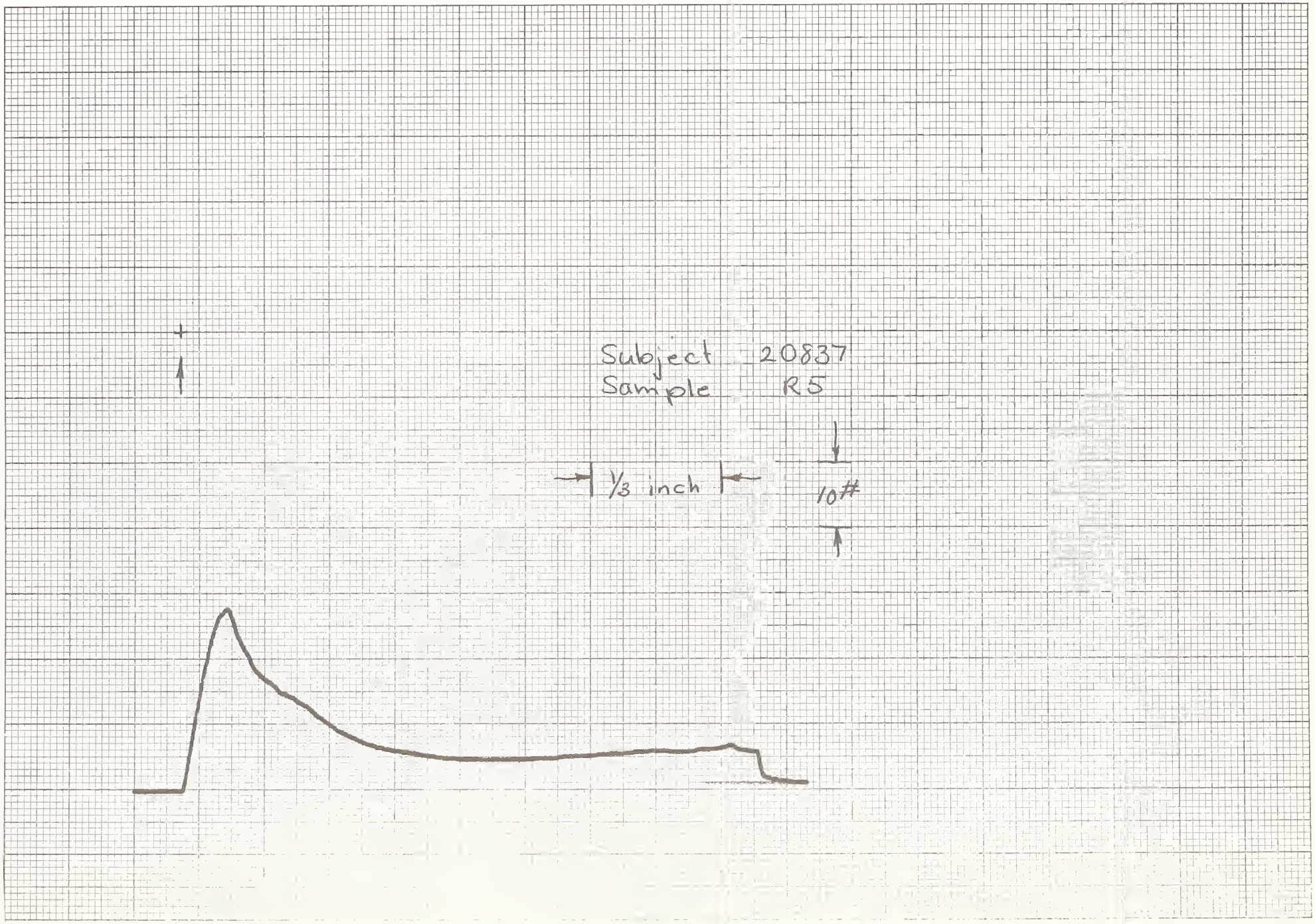
20822 R6

+
Subject 20822
Sample R7
1/3 inch
10#

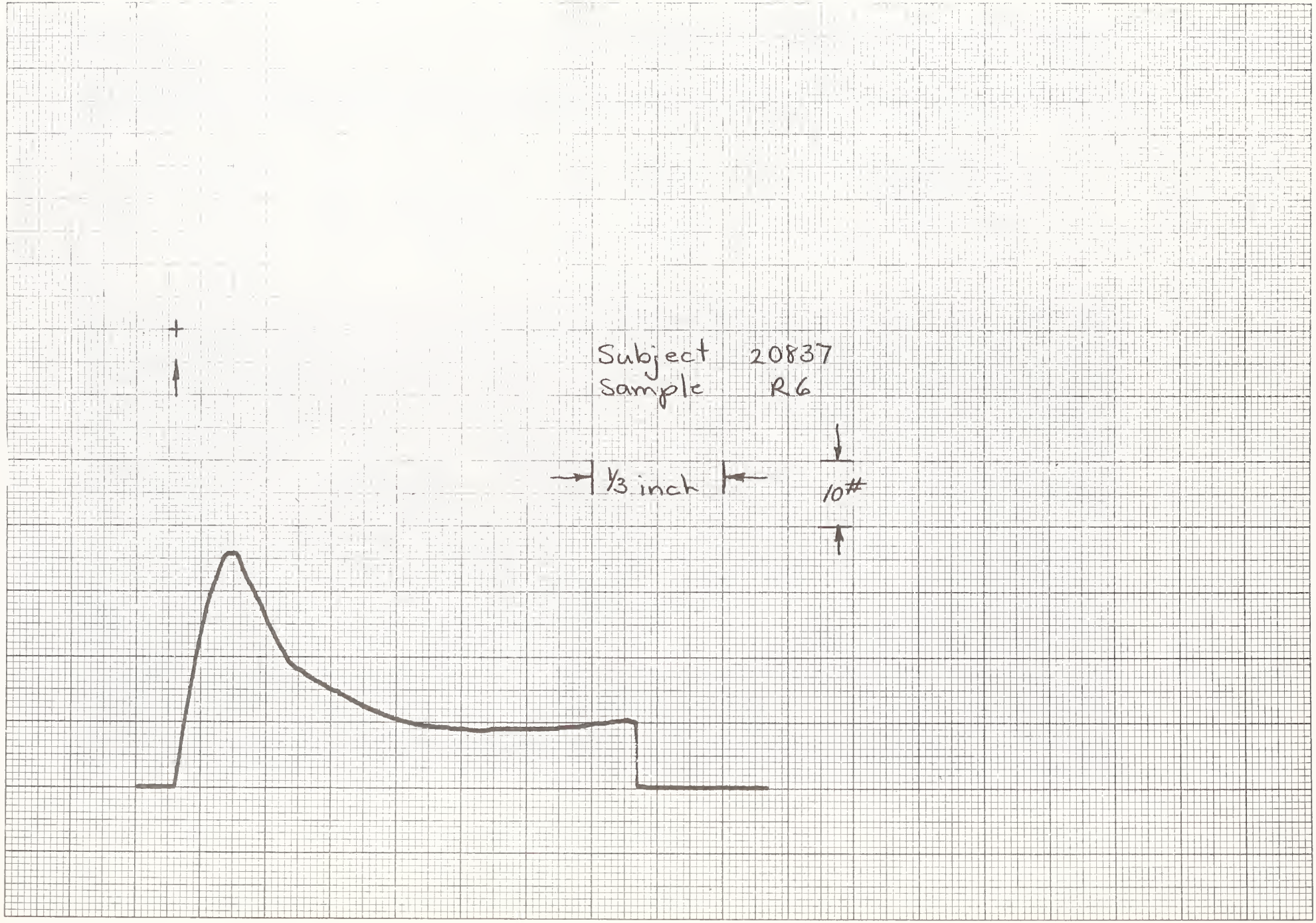
20822 R7

Subject 20822
Sample R8
1/3 inch
10#

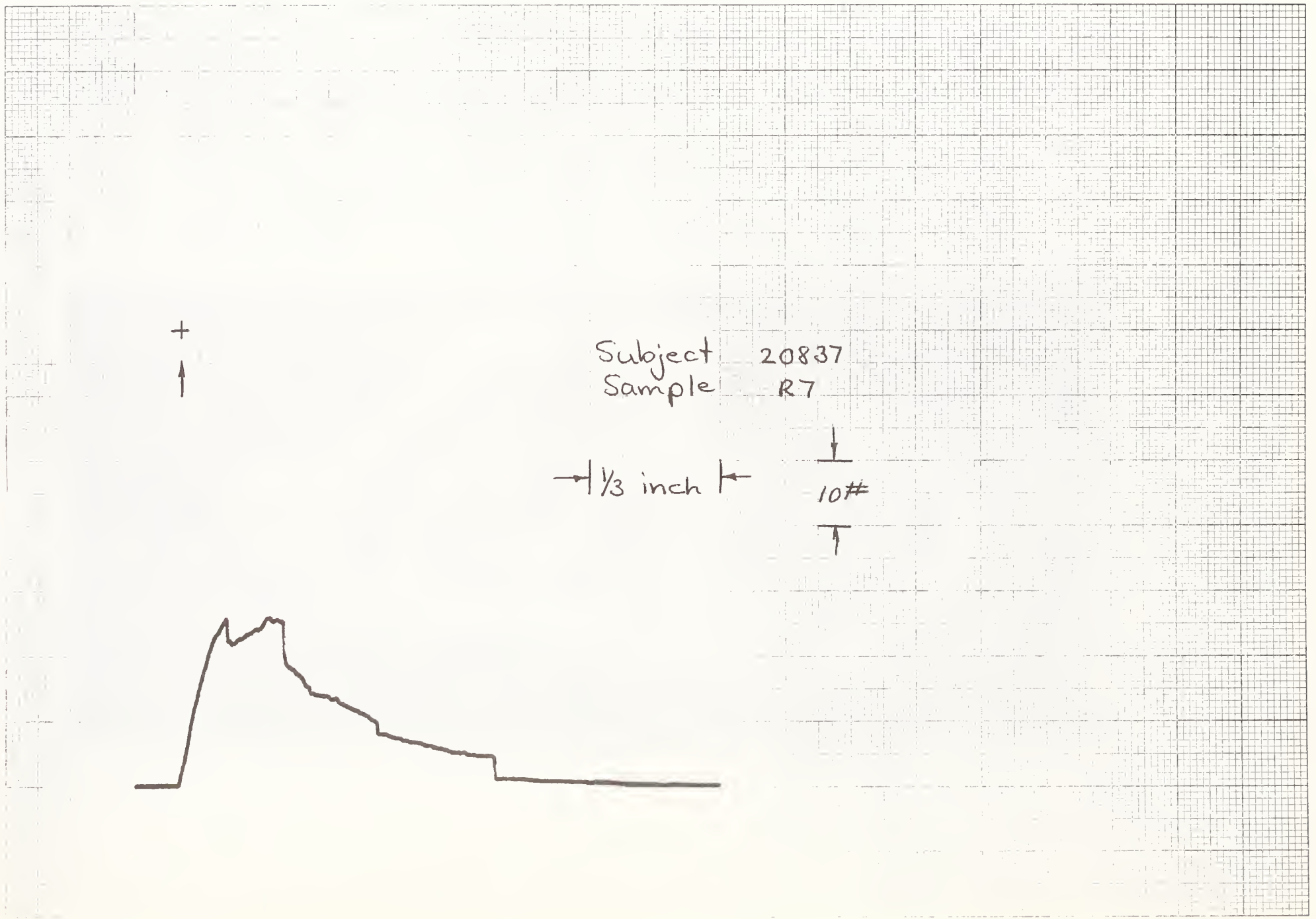
20822 R8

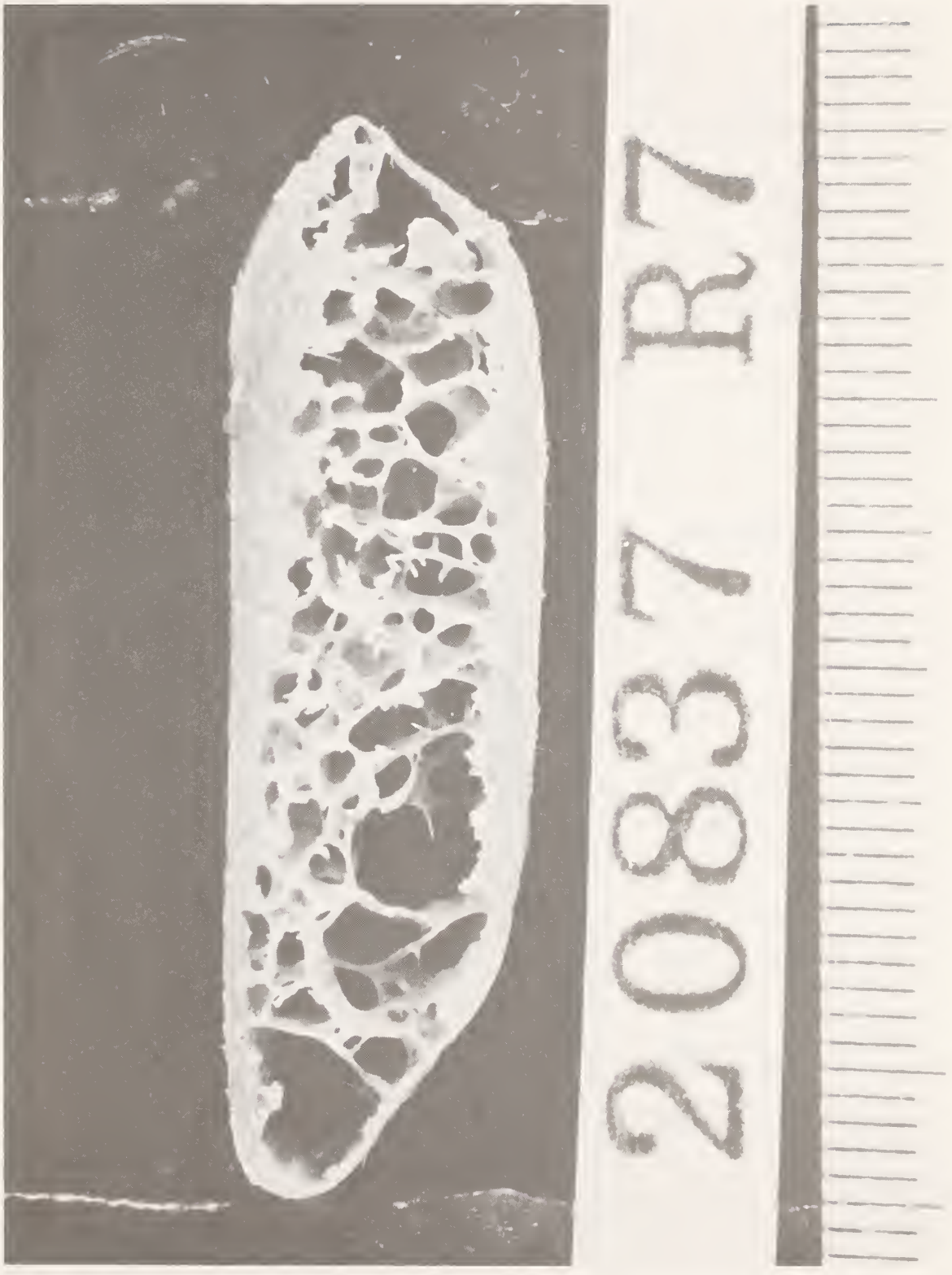

Subject 20837
Sample R5
1/3 inch
10#

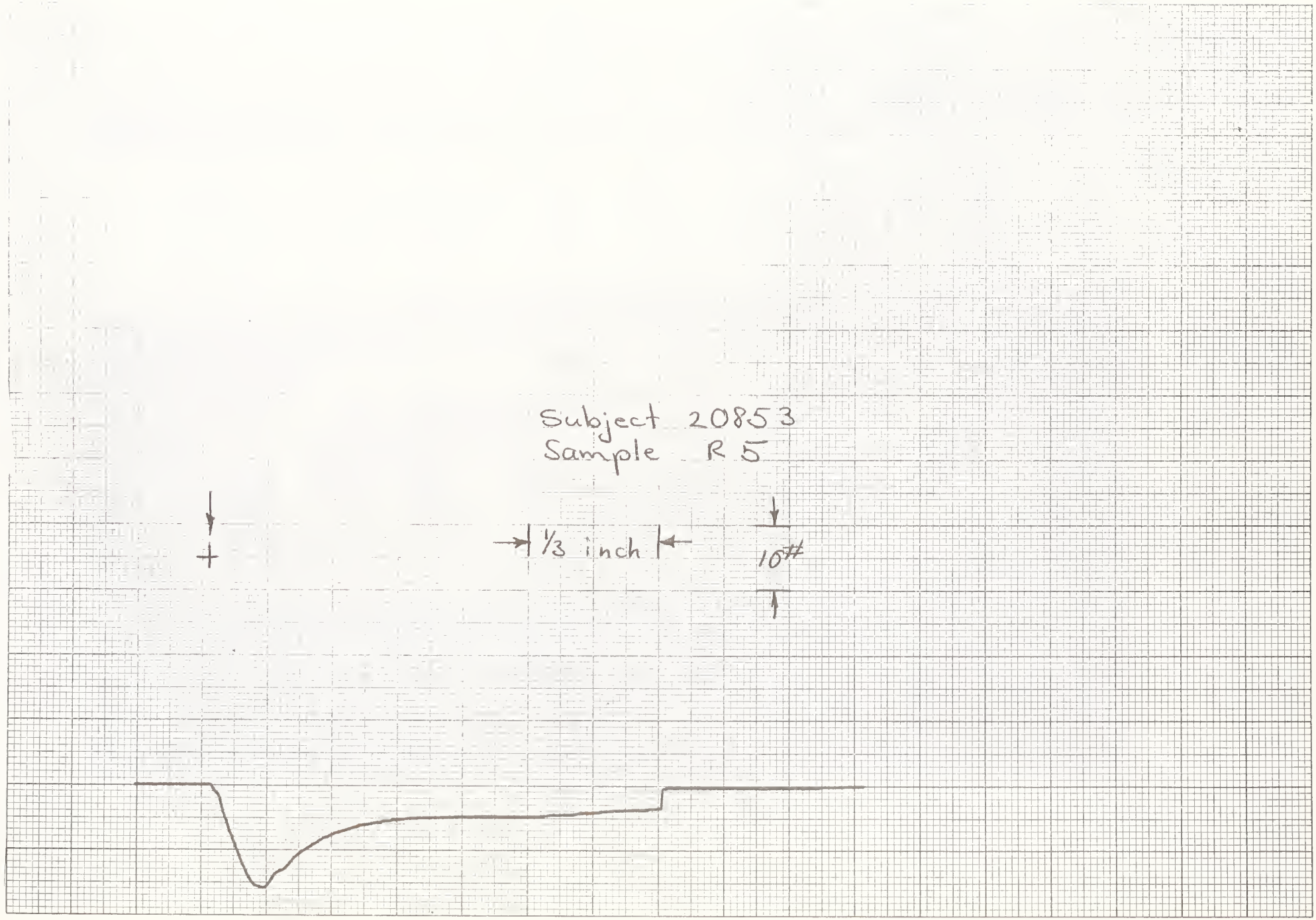
20837 R5


Subject 20837
Sample R6
⅓ inch
10#

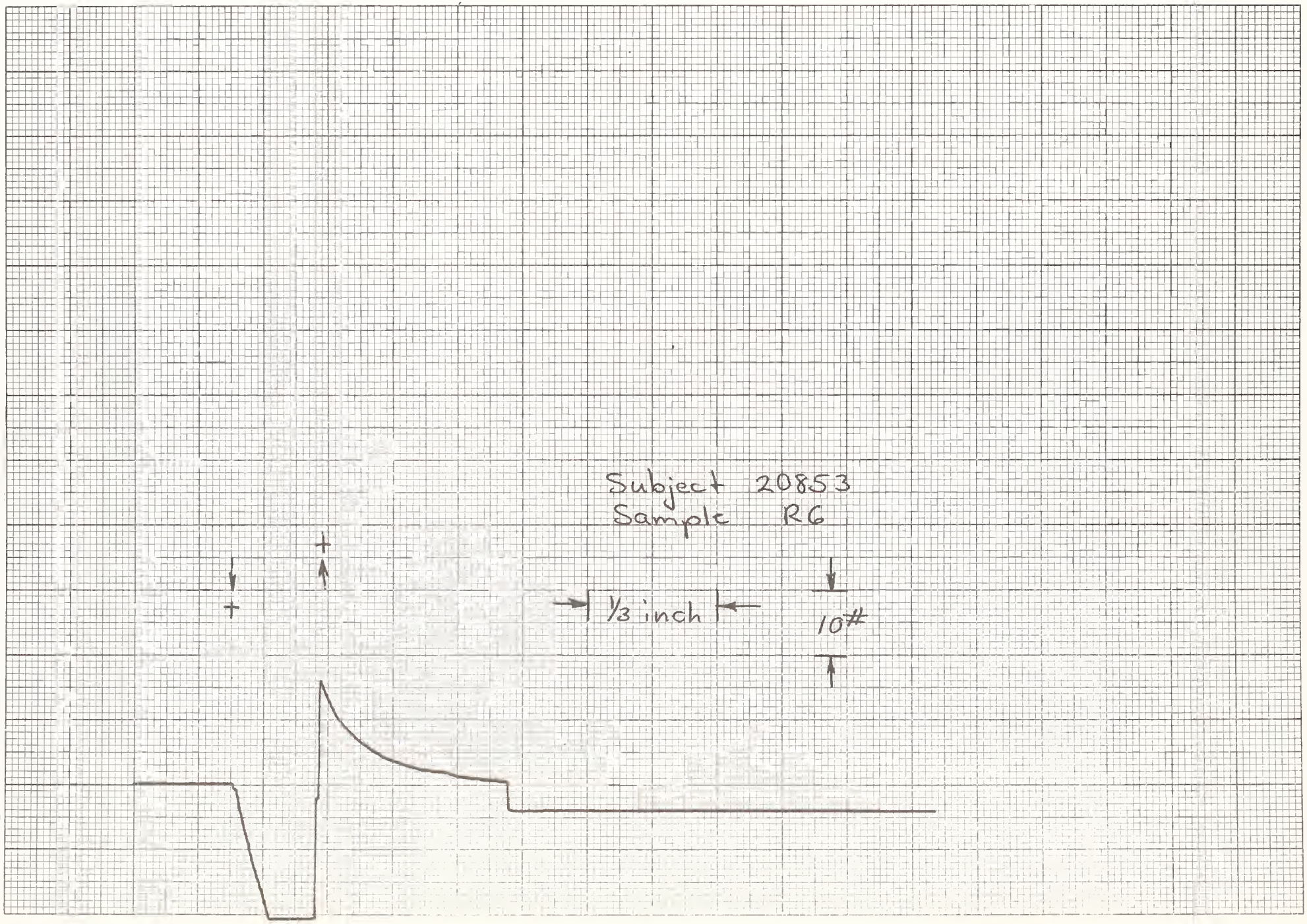
20837 R6


Subject 20837
Sample R7
1/3 inch
10#

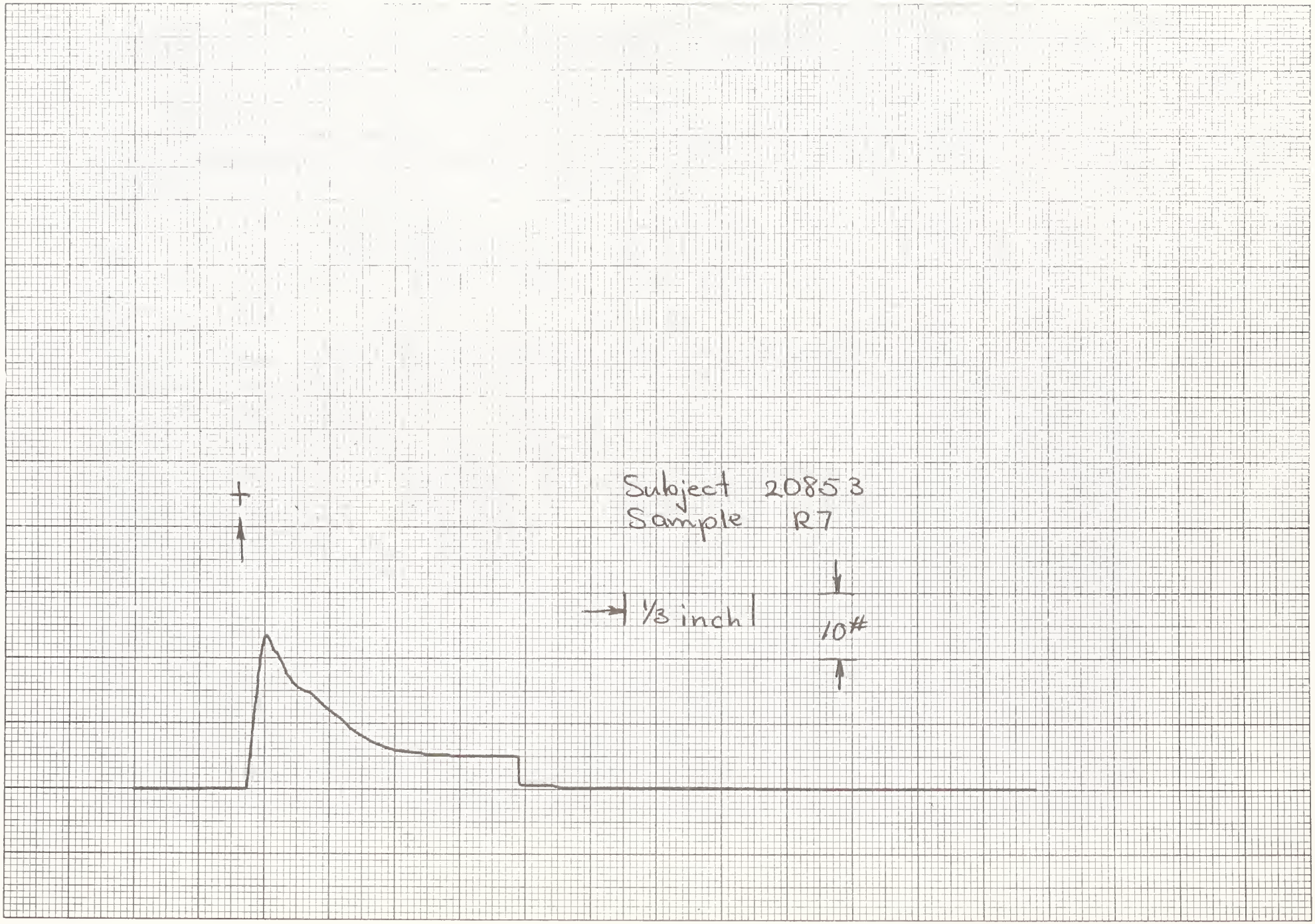

20837 R7


Subject 20853
Sample R5
⅓ inch
10#

20853 R5


Subject 20853
Sample RG
+
+
1/3 inch
10#

20853 R6

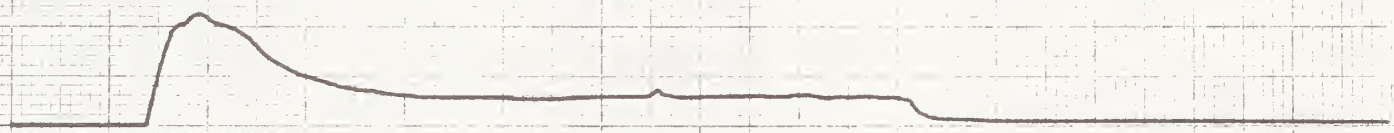

+
Subject 20853
Sample R7
⟷ 1/3 inch
10#

20853 R7

Subject 20853
Sample R8

1/3 inch

10#



20853 R8

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